Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 33 **NOVEMBER, 1950** **No. 11**

THE RADIOACTIVE EFFECTS OF ATOMIC WEAPONS

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IN discussing the physiologic effects of radiation, consideration must be given to the manner in which radioactivity is encountered. Man has for many years had intimate and reasonably accurate knowledge of the radioactivity emanating from x-ray machines and from radium. More recently work with cyclotrons has given rise to radioactive forms of many of the common elements. During the late war, in connection with the operation of the plutonium producing piles at Richland, Washington, and Oak Ridge, Tennessee, immense amounts of radioactivity were encountered which required enormous work in planning and building for protection of personnel against such radioactivity. It was not, however, until the explosion of the first atomic bomb in July, 1945, with the subsequent explosions over Japan in August of 1945, that radioactivity became important in civil defense planning.

In present planning various factors must be given consideration. Several atomic bombs have been exploded in the air and one bomb has been exploded under water. The effects of the air or water bursts are entirely different, both practically and in relation to human contact with radioactivity. Atomic bomb explosions in air are a very poor and ineffective way of utilizing radioactivity for destruction. A much more effective way of such utilization was found at Bikini in the underwater explosion. In this instance the intense heat of the bomb explosion, totaling several million degrees centigrade, turned many thousand tons of sea water into steam, in which the enormous radioactivity of the fission products was trapped and rained back to earth as the radioactive steam condensed. These radioactive fission products fell out over an area roughly five miles in diameter and so contaminated the target ships that all had ultimately to be sunk. The presence of radioactive sludge at the bottom of Bikini Lagoon continues to make that lagoon uninhabitable for humans. The A.E.C. has reported that almost all biological organisms living in the lagoon are radioactive. It is considered, however, by civil defense planners that such water explosions are an inefficient use of the energies available in time of war, and that we need not therefore be concerned with this particular type of explosion.

The term, "radiological warfare" is one which has occasionally been used and one for which some definition should be supplied. It refers to the concept that radioactive substances might be used to contaminate the air, the water, the food or the ground upon which people live. Water soluble substances might be put into municipal water systems, radioactive substances might be sprayed by planes over selected areas of land, and other means could be used to disseminate such radioactive substances. Here again the phenomenologist concedes that such use of radioactivity will be inefficient in terms of destruction, and therefore advises that radioactivity encountered through this means will be unlikely. We will therefore confine ourselves in this discussion to the effects of an atomic bomb exploded in the air above a given area.

Presented at the short course on Civil Defense, Minneapolis, Minnesota, August 31, 1950.

The explosion of the bomb in the air above a target gives rise to four successive waves of destructive activity. The first wave travels with the speed of light and includes the components of the electromagnetic spectrum such as light, heat, x-rays and gamma rays. The second wave travels somewhat more slowly and contains myriads of atomic particles and fission products, including neutrons. Third comes the shock wave, which travels with the speed of sound, and fourth the blast wave following immediately after the shock wave. At Hiroshima and Nagasaki the dangerously radioactive fission products rose into the stratosphere harmlessly. Biological damage came from the heat, the ultraviolet energies, the gamma rays and neutrons which were liberated at the instant of explosion but which instantly dissipate and are lost. Relatively very little radioactivity is left upon the ground after such an explosion. The injuries produced by the heat, light and gamma rays are produced at the instant of dissemination and before the blast effect can strike.

One must also consider the areas over which biological effects can be produced. From the point immediately underneath the bomb or target center to one thousand yards in all directions is the zone in which almost all biological organisms will die of radioactive burns. The only animals remaining alive in this zone would be those who had been screened by some effective radiological screening substance such as concrete. In the zone next furthest out, from one thousand yards to 1,250 yards, the survivors of the Japanese blasts were relatively few and those who did survive showed maximum radiological effects. The third zone, from 1,250 to 1,500 meters, gave rise to far fewer deaths, but in most persons in this area the radiological burns were severe. In the area from 1,500 to 1,750 yards from target center, severe superficial burns were produced, but no immediate radiological effects were noticed, although many individuals suffered delayed effects. In the zone 1,750 yards to 2,000 yards, even these delayed effects were few, although many superficial burns were encountered.

In this connection the experience of the Japanese in Hiroshima and Nagasaki are our best examples. In the Japanese, the injuries produced were a composite of flash burns from heat and radiation burns. In addition to these effects many survivors experienced blast injuries. The manner of injuries can be well understood if one imagines that the place of bomb explosion a few hundred feet above the ground produces in effect a small sun. At that height the heat from this sun will be sufficient to burn severely those who are close enough to the center. In addition to the heat the ultraviolet light will produce a severe burn, and finally the rays of shorter wavelength such as x-rays and gamma rays will reach the body, penetrate directly through it, and cause injuries to most of the cells through which they pass. The individual thus receives his total injury all in a flash and may die immediately from the combined effects. If further away from target zero, he may die more slowly within the first day or two, or if the injury was mild enough, may survive to show the effects of internal damage of one kind or another as permanent late results. If the exposure were very light, the damage may heal with no sequelae whatever. It is not our purpose to consider the burn and blast effect, since these are older subjects and are more thoroughly understood.

TABLE I. RADIATION SENSITIVITY OF TISSUE IN DECREASING ORDER

a. Lymphocytes	h. Connective tissue
b. Erythroblasts	i. Bone
c. Germinal epithelium of testis	j. Liver
d. Myeloblasts	k. Pancreas
e. Epithelium of intestinal crypts	l. Kidney
f. Germinal cells of ovary	m. Nerve
g. Basal layer of the skin	n. Brain
	o. Muscle

At the instant of explosion, gamma rays and neutrons are produced, which travel with infinite speed to the target which it is intended they destroy, and penetrate these targets as deeply as the energies which they carry allow. As the gamma rays and neutrons fly through the body they produce their damage by disrupting the various tiny atoms of which body cells are composed. In the course of passage of one neutron through the body, probably many thousands of atoms are disrupted. The amount of total body damage produced depends upon the total number of neutrons and gamma rays which penetrate the body and the degree of sensitiveness of the body. The degree of sensitiveness in turn varies with the species of animal, varies between different individuals of the same animal species, and varies greatly from one tissue to another. The most sensitive tissues in the animal organism are always those tissues which are in most active growth

TABLE II. RADIATION SENSITIVITY OF MAN AND ANIMALS. NUMBER OF ROENTGENS (r) REQUIRED TO KILL 50 PER CENT OF SUBJECTS

Fruit fly eggs	150 r
Guinea pig	200 r
Dog	325 r
Goat	350 r
Man	450 r
Mice	530 r
Rats	600 r
Rabbits	800 r
Bacteria	1,000-100,000 r

such as bone marrow, blood cells, sexual tissues and other tissues in decreasing order.

The dose of radioactivity received by any given individual varies as we have described with the distance from the blast and with the thickness of screening material between such individual and the blast.

Acute radiation sickness may take several forms, according to the severity of the exposure. The survivors in zone two will usually exhibit the fulminating form of the disease, which is characterized by the onset of nausea, vomiting, prostration and mild diarrhea within two to six hours after exposure and soon afterward of intractable diarrhea with delirium, tremors and finally death. In the early Japanese deaths there was very little evidence of external effect. Death occurred from the fifth to the tenth day. This fulminating type occurs in individuals who have received very large amounts of radiation. The hemorrhagic form of the disease occurs in those individuals who have been less hard hit with radiation. Vomiting, prostration and diarrhea occur early, lasting one or two days, and then there may be a period during which the individual seems well, lasting about five days, but this is followed by profound prostration, bloody diarrhea, and increasing fever. Bleeding into the skin and into the body orifices or cavities takes place and ulcers of mucuous membrane become more and more expansive. If the patient dies, it is usually in from three to six weeks after the exposure.

The third form of the disease is known as the pancytopenic, and is composed largely of patients in the hemorrhagic group who survive the six weeks period but continue to exhibit weakness, pallor and ulceration. Blood counts on these people show a severe diminution in all the formed blood elements. In those patients who are doomed to die from this form of the disease, loss of weight becomes more and more pronounced.

A most interesting phenomenon in connection with radiation sickness is the loss of hair from the scalp. It occurs equally in both sexes and appears about two weeks after the exposure. New hair of the same texture and color as the original hair grew in all individuals who survived.

Complications.—Acute radiation sickness in the Japanese was usually accompanied by severe blast and burn injuries, many persons dying from these injuries before the evidence of radiation sickness developed. Because of the skin and intestinal ulcers produced, bacterial infections were common, including bacterial invasion of the blood stream, pneumonia, lung abscesses and tuberculosis.

Sequelae.—Various late complications of acute radiation sickness seem possible, but as yet no extensive clinical experience with these has been obtainable in man. An extensive program of study of the Japanese survivors has been instituted in order to follow up these possibilities. If the human reacts like the experimental animal, genetic changes will be observed in the offspring of the Japanese victims but may not be observable for two, three, or more generations. Various experimental evidence indicates that malignant growths may be made to occur by heavy body radiation. A late development which has recently been found to occur in the Japanese victims is cataracts of the eyes.

Treatment.—No specific and curative treatment has yet appeared. Treatment in general depends upon rendering every possible form of support. One then hopes that the dose of radiation which the patient has received will not be sufficient to overwhelm his body defenses. Frequent transfusions of fresh blood are perhaps the most useful agent of support. Close attention to the salt and water balance will be instituted by the physician attending such a patient. Bacterial invasion may be combatted by the use of the newer antibiotic agents. Rest is important for several weeks for those patients receiving large doses of radiation. The Atomic Energy Commission announces that it is spending about one million dollars a year in studying the acute radiation syndrome. It is hoped that this study will yield some additional and more effective means of dealing with

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HEALTH—AN INTERNATIONAL AS WELL AS LOCAL PROBLEM

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PROBABLY all of us here tonight have worked with microscopes. Whether we are physicians, dentists, veterinarians, nurses, bacteriologists, engineers, or health educators, we have all studied biology. The study of life, if it is to amount to anything more than theory, requires the use of the microscope. Most of us became acquainted with this useful instrument in our high school days, and some of us have continued to use it in our work ever since. Every public health person realizes how potent the microscope has been in our fight on disease. Without it, we would not possess a fraction of our present knowledge of tuberculosis, syphilis, typhoid fever, and all the other bacterial diseases. By long and careful study, we have been able to learn many of the secrets of the minute forms of life that cause disease.

All of us, too, have had the experience of finding our eyes grow tired with long concentration on some such tiny particle as a pathogenic organism or a blood cell. In our school days we sought relief by looking away from the microscope and out of the window—over the tree tops—up at the far-away sky. But how many of us, I wonder, have gone beyond that? How many of us have ever studied the worlds beyond our own, as revealed by a giant telescope?

It may seem to you that looking at the universe through a telescope has little meaning for the public health worker. Yet at all times, and particularly at a time like the present, we may need to give our eyes and our minds a rest from the close study of immediate problems. We need to take note of what is happening in the broader world that lies beyond the scale of our microscopes.

Tonight marks the close of the fourth year of the Minnesota Public Health Conference. At each previous annual meeting, your president and other speakers have stressed the need for developing *local health services*. I know that in earlier sessions of this present conference, you have all discussed that matter and many problems related to it. We doctors, for instance, talked about the duties of the health officer in a small town. In a manner of speaking, we looked at our health problems through a microscope. Then Mr. Stowman* took us up on a hilltop and gave us a view of public health as it looks from the standpoint of the World Health Organization. He made us realize that you can't always pin down health and disease under an oil-immersion lens. You also need to look at it through the great, world-sweeping eye of a telescope.

Meeting local health needs is important—vitally important. But we must beware of developing the complacent attitude that, if we take care of our home-town problems, we need do nothing more. Our old Minnesota friend, Dr. Herman Hilleboe, has reminded us that "There can be no isolationism in the field of health. The fight against disease is not a national or racial problem; it is a task for the whole of humanity." And at the 1946 meeting of the American Public Health Association, just after the close of that war that we fondly hoped was the last one for our generation, Dr. Thomas Parran told us that "by force of events we have become citizens of the world."

Our world citizenship in matters of health has become even more apparent during the last few years. Within the lifetime of most of us, our world has shrunk to such a degree that we scarcely need a telescope to see into its remotest corners. Time and again we are reminded that disease is no respecter of international boundaries—that health problems in any part of the world are our problems.

In the United States, particularly in our own Middle West, we enjoy long life, and our general death rate is low. Our children's expectation of life at birth today is close to seventy years. Diseases that attacked us frequently in the early days—smallpox, typhoid fever, cholera—are now almost unknown in Minnesota and our neighboring states. Yet only the thinnest film of protection lies between us and many potential epidemics. As Dr. Frank Boudreau puts it, "A yellow fever mosquito may easily travel to this country as a stowaway on a plane from South America. A rat infected with plague may find its way from China,

Retiring president's address presented at the annual meeting of the Minnesota Public Health Conference, September 26, 1950.

*Kund Stowman, Chief, Research and Technical Advisory Branch, National Health Division, U. S. Public Health Service.

India, or South America. An apparently healthy passenger may be a carrier of cholera or other intestinal disease." And no longer can we depend upon quarantine to safeguard us. That system worked pretty well when travel was slow and the plague spots of the world were far away. In 1950, the European refugee infected with typhus, the Brazilian with malaria, the Korean with cholera, are right outside our doors. We must combat these diseases at their source in order to prevent their spread into our own vulnerable territory.

Some people live in daily fear of bacteriological warfare. If they only realized it, a sporadic, undirected bacteriological warfare is being waged against us all the time. Bacteria menace us far more widely and more constantly than bombs. Our only defense against such warfare is *the building up of international co-operation.* In a world in which co-operation on the political level seems at present an unrealizable dream, it is heartening to recall that it has existed for a long time in the field of health. Widespread public health is both an instrument and a condition of any lasting peace. In that same 1946 address by Dr. Parran from which I quoted earlier, there is also this assertion: "The World Health Organization brought together for the first time after the war, representatives of virtually all nations, including certain ex-enemy nations. It is worth while recalling that after the first World War, a conference on health was the first to bring together representatives of nations which a few months before had been at each other's throats."

And note this comment by Raymond B. Fosdick, former president of the Rockefeller Foundation:

"An American soldier wounded on a battlefield in the Far East owes his life to the Japanese scientist, Kitasato, who isolated the bacillus of tetanus. A Russian soldier saved by a blood transfusion is indebted to Landsteiner, an Austrian. A German soldier is shielded from typhoid fever with the help of a Russian, Metchnikoff. A Dutch marine in the East Indies is protected from malaria because of the experiments of an Italian, Grassi; while a British aviator in North Africa escapes death from surgical infection because a Frenchman, Pasteur, and a German, Koch, elaborated a new technique. . . Our children are guarded against diphtheria by what a Japanese and a German did; they are protected from smallpox by an Englishman's work; they are saved from rabies because of a Frenchman; they are cured of pellagra through the researches of an Austrian. From birth to death they are surrounded by an invisible host—the spirits of men who never thought in terms of flags or boundary lines and who never served a lesser loyalty than the welfare of mankind."

Well, there you have two admirable examples of the telescopic view of public health. You may agree with that view in principle. But you may say that it doesn't exactly solve your local medical, nursing, or sanitation problems, and it doesn't throw much light on what we ought to do in the present situation, when those needs are being ominously underscored by the threat of total war. Whether or not that threat materializes, it is likely that many public health people will be called upon for special services, thus jeopardizing our local health programs. I should be doing you no service if I brought my year as your president to a close with nothing more than the request that you try from now on to take a broader view of all health problems. So, let me try to round out this valediction with a few concrete suggestions.

First, we must realize that the requisites for individual, public, and world health *are all interdependent.* One individual's sinusitis or migraine may cause him to make a rash judgment, a wrong decision, a costly mistake. I should not be surprised if a future autopsy on Stalin were to reveal evidence of a gnawing gastric ulcer. Nor is it beyond the bounds of belief that nations were plunged into war a decade ago chiefly because a surly little boy named Adolf Schickelgruber was kicked around by a frustrated father and nagged by a neurotic mother. I am not suggesting that any one of us here this evening could precipitate a global war by neglecting a decayed tooth or an ingrowing toenail, but it is by no means impossible that such a thing could lead, through a series of chain reactions, to far-reaching and fatal consequences, not only for the individual concerned but also for many other persons.

Viruses are not the only things that spread without being noticed. The same process takes place with states of mind. We can infect other people from our own despondency or hostility, just as easily as from a cold in the head. Hence our first responsibility is to ourselves—to gain and main-

tain that condition of "complete physical, mental, and social well-being" that constitutes the World Health Organization's definition of health.

Second, in taking the long view we must not overlook our local needs. In learning to use the telescope we must never entirely substitute it for the microscope. Our goal, to be sure, is optimal health for every human being. But in order to attain that goal we must secure the active participation of as many people as possible. As Dr. Brock Chisholm points out, "Health cannot be given as a gift. It must be obtained through constant vigilance and increasing action." To maintain that vigilance, to guarantee that action, we must have broad participation in all worthwhile health measures. I have said little tonight about that phase of our responsibilities, because anything I might say is already well known to most of you. Talking about local health organization in Minnesota is like talking about the eradication of tuberculosis. We know all the facts necessary to do the job. All that remains for us now is to do it. So, may I urge upon all of you once again to take stock of your local health services and needs, and to talk about your problems with your own community leaders. Effective action in this respect will stem only from many groups of well-informed people who have a clear idea of what they need and are determined to get it and make it work. That's how local health services have come into being in other states. Ask them how they did it, and the answer always boils down to the simple statement that a lot of people wanted it. When enough people want something, they eventually get it.

No matter what the immediate future may hold, public health services in our state should not be curtailed. Whatever defensive measures may be set up against possible attack, those measures will be centered in and directed by our public health organization. In that task, as in many others, this Minnesota Public Health Conference is now in a position to give strong leadership. It is true that we are a young organization. But in times of crisis, young people often have to grow up pretty fast. The fact that we have already gained recognition by the American Public Health Association speaks well for our progress toward maturity. That progress will be aided, and our ability to carry responsibility will be increased, by the addition to our membership of more members of the health professions and more lay people who have an intelligent and active interest in community health.

We see before us today, as we have seen in previous years, the spectacle of many nations that have fallen under the heel of dictators because they did not know or did not care enough to hold on to their liberties. We will not join them unless we allow our democratic processes to lapse. One way of maintaining those democratic processes is to build up associations in which, as in this conference of ours, we work for the benefit of everyone through the active participation of all qualified people.

We have talked tonight about science—about using the instruments of science for the discovery of truth and the promotion of health. Our generation has learned through hard experience the tragic *neutrality* of science. It may be used to save life or to destroy it. But we have not abandoned science for that reason. Nor do we have any intention of doing so. Through the gradual spread of knowledge, we may hope to bring about the end that we so greatly desire—the attainment of universal peace and security. Improvement of the physical, mental, and social health of all nations is essential to that end. We need to establish in every country a nucleus of workers who have the necessary training and skill to promote all aspects of health.

This is not a one-sided missionary endeavor for the American people. Let us never make the mistake of assuming that all knowledge and all truth are in our possession. There is much that we can learn from other countries, even as they have much to learn from us. We need to pool *all* health knowledge—to work with all people of good will everywhere toward the achievement of world-wide health. To do this effectively we must continue to use both the microscope and the telescope —to study intensively our own health needs and those of our home communities, our state, and our nation, but at the same time to look beyond these immediate concerns to those of all the nations of the earth.

FLATFOOT, WITH SPECIAL CONSIDERATION OF TARSAL COALITION

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FLATFOOT is one of the common causes of foot pain.[2] Certain types of flatfoot are more disabling than others. Flatfoot causes more discomfort in adolescence than in later life. The patient tends to modify his life to his disability as he gets into the twenties and thirties. Canadian Army statistics, based on examination of 3,600 young men, disclosed that 8 per cent of the men had some form of disabling flatfoot.

A new concept regarding the cause of rigid flatfoot recently has been advanced by Harris and Beath.[5] This has changed the thinking about this particular type of flatfoot. It is, therefore, felt that a review of flatfoot, particularly rigid flatfoot, will be timely.

Classification of Flatfoot

Flatfoot may be divided into three main types, which are listed in Table I.

TABLE I. CLASSIFICATION OF FLATFOOT

I.	Flattened longitudinal arch. This is a structural and asymptomatic derangement; it is not a pathologic condition.
II.	Relaxed flatfoot. Hypermobile flatfoot with short tendo achillis.
III.	Rigid flatfoot.
	A. Coalition of the tarsus.
	1. Classification as to type of union.
	a. Fibrous.
	b. Cartilaginous.
	c. Bony.
	2. Classification as to site.
	a. Talocalcaneal.
	b. Calcaneonavicular.
	c. Involvement of other tarsal bones.
	B. Arthritis of tarsal joints.

Flattened Longitudinal Arch

The most common type of flatfoot is a simple flattening of the longitudinal arch. This type of flatfoot is not painful. It is an individual characteristic, like the shape of the head or the length of the arms, and is familial. Ankle valgus is not present, and there is no rigidity or hypermobility. This type of flatfoot is not affected by weight bearing, and it does not produce any roentgenographic changes except a depression of the longitudinal arch.

It is extremely important to recognize this entity for what it is—a symptomless, nonpathologic, individual characteristic. If the patient has foot pain, one must search elsewhere for its cause.

Relaxed Flatfoot

Relaxed flatfoot also has been designated by the term "hypermobile flatfoot with short tendo achillis," which is lengthy but descriptive. This type of flatfoot is pathologic and is a well-known clinical entity. Examination disclosed that approximately 6 per cent of 3,619 recruits for the Canadian Army had mild or severe flatfoot of this type.[4,5] The deformity exists from childhood, but pain does not occur until adolescence.

Three basic theories have been advanced to explain the cause of relaxed flatfoot: (1) congenital relaxation of the supporting tarsal ligaments; (2) congenital shortening of the triceps surae group of muscles resulting in shortening of the tendo achillis, which pulls on the calcaneus and causes a valgus position of this bone, and (3) congenital deficiency in the skeletal support of the talus.

Harris and Beath[4] expressed the opinion that the basic cause of this type of flatfoot is improper support of the talus by the anterosuperior portion of the calcaneus. This results in a dropping downward and inward of the talus, which, of course, flattens the longitudinal arch and produces a prominence of the head of the talus on the medial side of the foot, and valgus of the ankle. Shortening of the tendo achillis occurs secondarily. Pain is caused by excessive ligamentous strain, and traumatic arthritis frequently develops in later years.

The characteristics of the relaxed flatfoot with a short tendo achillis are ankle valgus, flattening of the longitudinal arch, and a medial prominence of the foot (Fig. 1*a* and *b*). The normal contour of the longitudinal arch is restored when the weight of the body is removed from the feet (Fig. 1*c*). A shortened tendo achillis is shown in Fig. 1*d*. Dorsiflexion beyond 90 degrees is not possible. When testing the extent of dorsiflexion, the patient's knee should be in a neutral position, not in a flexed or hyperextended position. A further characteristic, emphasized by Harris and Beath,[4] is hypermobility of the midtarsal joints which can

Read at the meeting of the Minnesota State Medical Society, Duluth, Minnesota, June 12 to 14, 1950.
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be elicited by holding the calcaneus in the palm of the left hand and moving the fore part of the foot medially and laterally.

Roentgenographic examination is helpful, al-

Treatment of relaxed flatfoot is directed toward support of the talus. Active support is laudable but seldom possible. In cases in which the deformity is not severe, exercises to strengthen

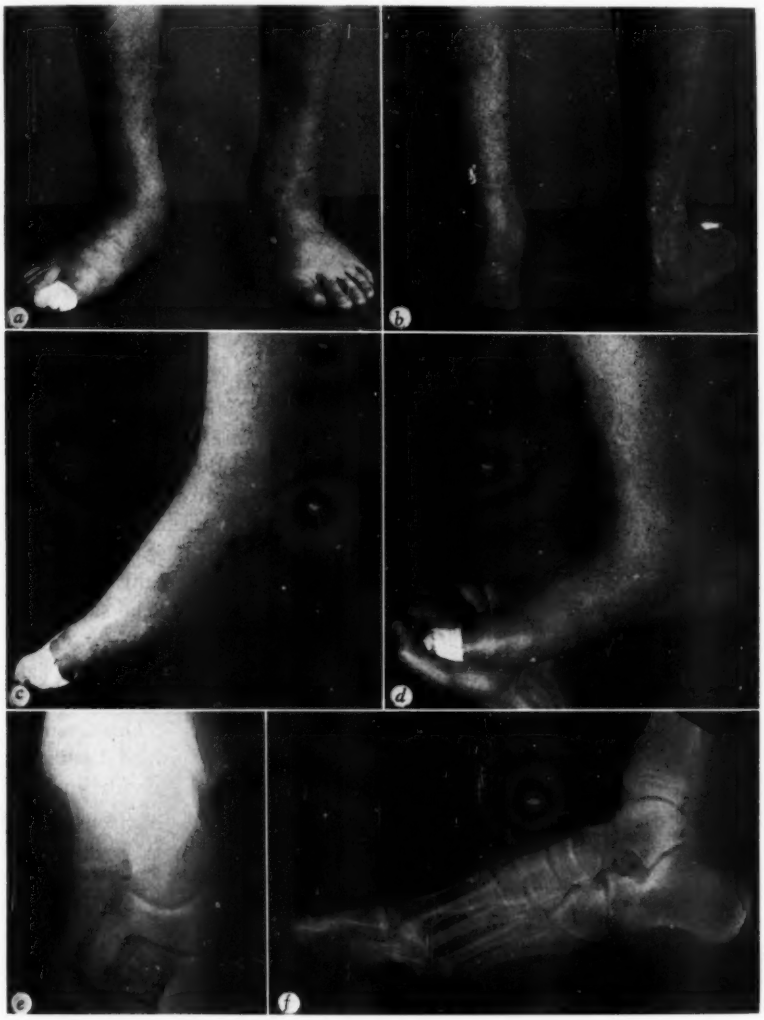

Fig. 1. Hypermobile flatfoot with short tendo achillis. *a*, Front view; *b*, rear view; *c*, appearance of arch without weight bearing; *d*, maximal dorsiflexion obtainable; *e*, anteroposterior roentgenogram; *f*, lateral roentgenogram.

though not diagnostic. The talus is seen to be placed medially and inferiorly on the calcaneus. A lateral deviation of the fore part of the foot on the talus also occurs (Fig. 1*e* and *f*). One should read the Army Foot Survey by Harris and Beath[3] for accurate measurements of the tarsal bones and for a description of relaxed flatfoot.

the supporting muscles of the foot are sometimes of value if the patients are co-operative. A passive form of support usually is necessary, however. In these cases longitudinal arch supports of metal, cork, sponge rubber, felt, leather or other material usually will relieve the symptoms. In addition, a wedge may be placed on the inner part of the heel of the shoe if there is much

ankle valgus. In cases in which relaxed flatfoot causes considerable disability and is not relieved by this form of treatment, operation often is necessary. Many operations have been devised for relief of pain in the relaxed flatfoot. Lengthening of the tendo achillis alone has been advocated by some surgeons. Stabilization of the talonavicular, naviculocuneiform and cuneiform-metatarsal joints alone or in combination has been advocated. Plication of the medial tarsal ligaments combined with tendon transplantation with or without arthrodesis, also has been used. However, if operation is indicated, triple arthrodesis, that is, calcaneotalar, calcaneocuboidal and talonavicular arthrodesis, probably is the procedure of choice. Operation should be done, as a rule, when patients are in the teens or early twenties. As mentioned previously, the patients usually adjust to a sedentary life after they reach the twenties, and operation is seldom indicated then.

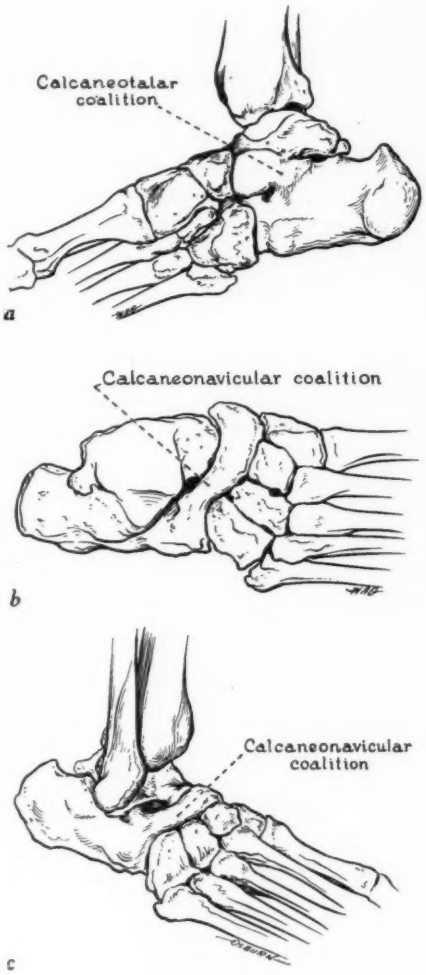

Fig. 2. Artist's drawing of calcaneonavicular coalition. *a*, Medio-inferior view; *b*, anterior view; *c*, lateral view.

Fig. 3. Calcaneonavicular coalition (Case 4). *a*, Appearance of feet; bony coalition on right side (shaved); fibrous coalition on left side (unshaven); *b*, limitation of inversion.

Rigid Flatfoot

Except in a very few cases of tarsal arthritis resulting from rheumatoid arthritis, infection or trauma, rigid flatfoot is due to tarsal coalition. Coalition, by definition, means the growing together, or union of. Applied specificially in this case, it denotes the union of two or more tarsal bones. The union may be fibrous, cartilaginous or bony (Table I), and it may occur between the calcaneus and the talus, between the calcaneus and the navicular (Fig. 2*a*, *b*, and *c*), or rarely between other tarsal bones.

Rigid flatfoot has been most commonly called "peroneal spastic flatfoot" in the past. Owing chiefly to the writings of Harris and Beath,[5] this concept is being discarded. The rigidity of this

type of flatfoot is caused by actual union of the tarsal joints, and not by spastic peroneal muscles. The peroneal muscles are not spastic, but simply tight because the tarsal rigidity prevents their stretching in a normal fashion. Inversion of the foot is impossible in cases of rigid flatfoot. Harris and Beath said that anatomists have known of tarsal coalition for fifty years. Sporadic reports of cases of calcaneonavicular coalition appeared in the literature in 1921,[7] 1923[6] and 1927,[1] but the entity calcaneotalar coalition was not described clinically until Harris and Beath[5] published their significant report in 1948.

Fig. 4. Positioning for making special roentgenograms ("coalition views") to demonstrate calcaneotalar coalition.

The incidence of tarsal coalition was 2 per cent among 3,600 men who were examined for enlistment in the Canadian Army.[5] Operation disclosed tarsal coalition in five cases which were observed at the Mayo Clinic in 1948 and 1949. In three of these cases, the coalition involved the calcaneus and talus; in the remaining two cases, it involved the calcaneus and navicular. The anomaly undoubtedly was present but was not recognized in other cases which were observed in the same period. We are recognizing more and more cases as our knowledge of the subject increases.

Like hypermobile flatfoot, tarsal coalition is congenital and produces symptoms in the teens.

Fig. 5. Roentgenograms in case of calcaneotalar coalition in right foot (Case 1). *a*, Lateral roentgenogram of right foot; *b*, lateral roentgenogram of left foot: no change is evident in either *a* or *b*; *c*, sustentaculum tali-talar joint faintly visible in medial portion of left foot; *d*, obliteration of sustentaculum tali-talar joint of right foot; *e*, appearance of right foot one year after calcaneotalar arthrodesis.

Fig. 3*a* shows the characteristic appearance of the feet in a case of tarsal coalition. This anomaly causes flattening of the longitudinal arch, a medial prominence of the tarsus in the region of

the head of the talus, and ankle valgus. The arch of the foot is not affected by weight bearing. In Figure 3*b* one can see that the patient is unable to invert the foot. The patient illustrated has a complete bony coalition on the right or the shaved side but only a partial coalition on the left or unshaved side. Although the peroneal muscles and tendons appear tight, they are not in true spasm.

Fig. 6. Roentgenograms in case of calcaneotalar coalition in right foot (Case 2). *a*, Lateral roentgenogram of right foot showing spurring of supero-anterior lip of talus; *b*, lateral roentgenogram of left or normal foot; *c*, lateral roentgenogram of right foot made nineteen months after triple arthrodesis; *d*, anteroposterior roentgenogram of left or normal foot made at same time as the one shown in *c*.

In cases of tarsal coalition, roentgenographic examination is of real value if properly used. The presence of this anomaly always can be suspected on the basis of the clinical findings. If examination discloses rigid flatfoot, one should attempt to prove the presence of tarsal coalition by roentgenographic examination. Routine anteroposterior and lateral roentgenograms always will reveal the presence of calcaneonavicular coalition. Although routine roentgenograms sometimes will suggest the presence of calcaneotalar coalition, a special roentgenogram, which Harris and Beath[5] have designated the "coalition view" (Fig. 4), is necessary if the presence of this anomaly is to be proved. By the use of this roentgenogram, obliteration of the sustentaculum tali-talar joint can be demonstrated. In cases of calcaneotalar coalition, routine roentgenograms often will disclose spurring of the anterior-superior lip of the talus and a "fuzziness" of the subtalar joint, when

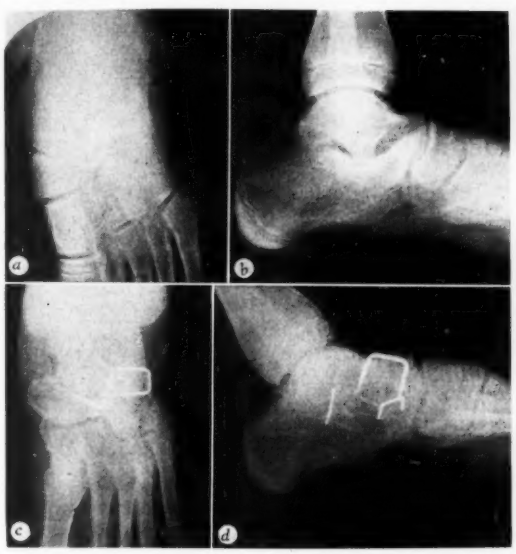

Fig. 7. Roentgenograms in case of calcaneonavicular bar (Case 3). *a* and *b*, anteroposterior and lateral roentgenograms of right foot showing calcaneonavicular bar; *c* and *d*, anteroposterior and lateral roentgenograms of right foot made twenty months after triple arthrodesis.

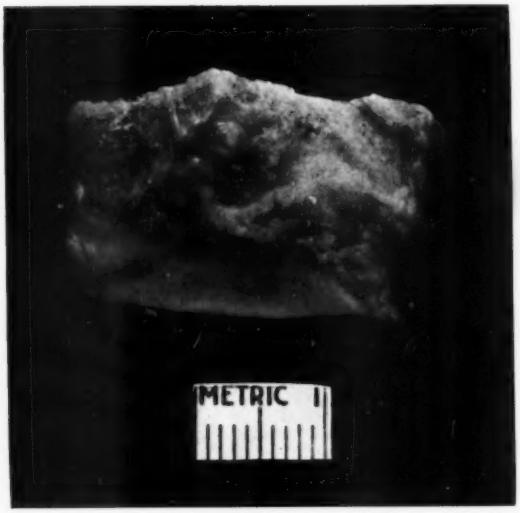

Fig. 8. Calcaneonavicular bar removed in Case 3.

be performed. This was illustrated in one of our cases (Case 4), in which the patient had calcaneonavicular coalition. Most of the pain was centered in the region of the calcaneocuboidal joint, and the patient obtained complete relief of his pain when triple arthrodesis was performed. As in the treatment of disabling relaxed flatfoot, operation should not be undertaken until the patient has reached the age of ten or twelve years.

Report of Cases

Case 1.—A girl, aged eighteen years, came to the clinic because of pain in the right foot. The pain had been present for one year. Examination disclosed the usual signs of tarsal coalition including inability to invert the foot, a prominence on the medial portion of the foot, and flattening of the longitudinal arch. Lateral roentgenograms did not disclose any definite change in either foot (Fig. 5*a* and *b*). In a special roentgenogram ("coalition view") of the left foot, the sustentaculum tali-talar joint could be seen faintly in the medial portion of the foot (Fig. 5*c*). A similar roentgenogram of the right foot disclosed obliteration of this joint (Fig. 5*d*). The presence of calcaneotalar coalition was proved at operation. The calcaneotalar bridge was excised and calcaneotalar arthrodesis was performed. This procedure produced partial relief of the symptoms. Figure 5*e* shows the roentgenographic appearance of the foot one year after the operation. As our experience has increased, we feel that a better result would have been obtained if triple arthrodesis had been performed in this case.

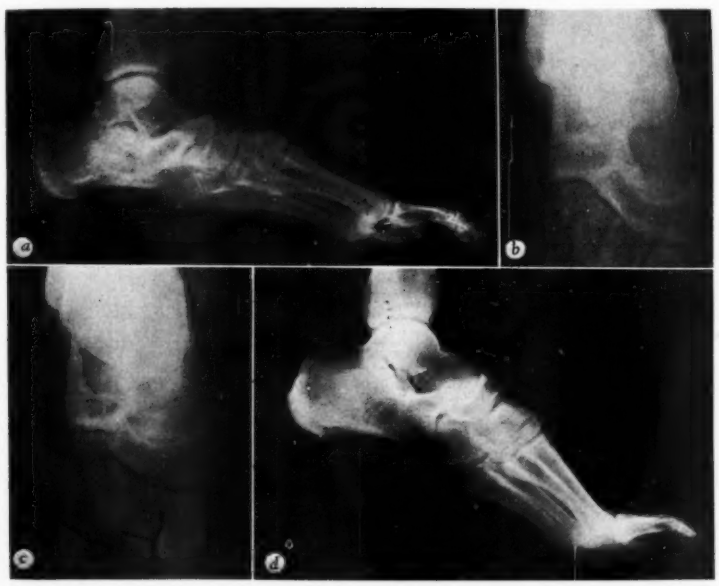

Fig. 9. Roentgenograms in case of calcaneonavicular coalition (Case 4). *a* and *b*, Lateral and anteroposterior roentgenograms of right foot showing bony coalition of the calcaneus and navicular; *c* and *d*, anteroposterior and lateral roentgenograms of left foot showing fibrous coalition of the calcaneus and navicular.

compared with similar roentgenograms of the opposite or normal foot.

Treatment of rigid flatfoot should be directed toward the cause of the condition, which, except in a very few cases, is coalition of two or more of the tarsal bones. Triple arthrodesis usually is the treatment of choice. Calcaneotalar and talonavicular arthrodesis probably are inadequate. In addition, calcaneocuboidal arthrodesis should

Case 2.—A girl, aged thirteen years, had had pain in her right foot for several years. Examination revealed a prominence of the medial part of the right tarsus and inability to invert the foot. A lateral roentgenogram of the right foot (Fig. 6*a*) disclosed a finding frequently observed in cases of calcaneotalar coalition, namely, spurring of the superior-anterior lip of the talus. It also revealed "fuzziness" of the subtalar joint when it was compared with a similar roentgenogram of the left or normal foot (Fig. 6*b*). The presence of calcaneotalar coalition was proved at operation. Figure 6*c* is a lateral roentgenogram of the right foot which was made nineteen months after triple arthrodesis was performed, and Figure 6*d* is a similar roentgenogram of the opposite foot which was made at the same time. At that time, the patient did not have any symptoms which were referable to the right foot and the appearance of the foot was good.

Case 3.—A boy, aged ten years, was brought to the clinic because of disabling pain which had been present in his right foot since he had fallen six months previously. Examination disclosed tarsal rigidity, medial prominence of the tarsus, and ankle valgus, which are the usual findings in cases of tarsal coalition. Anteroposterior and lateral roentgenograms disclosed a calcaneonavicular bar (Fig. 7*a* and *b*). Figure 8 shows the bar which was removed in the course of triple arthrodesis. The bar extended across the "sinus tarsi" in the usual manner and resulted in bony union between the calcaneus and navicular. When this paper was written, the patient did not have any pain in his right foot. Figure 7*c* and *d* shows the roentgenographic appearance of the foot twenty months after the operation.

Case 4.—A man, aged twenty-four years, had had pain in his feet for ten years. The pain had been more severe in the right foot than it had been in the left foot. He had been rejected for service in the Army in World War II, and he had been unable to obtain regular employment. The appearance of his feet is shown in Figure 3*a* and *b*. Roentgenographic examination disclosed bony coalition of the calcaneus and navicular of the right foot (Fig. 9*a* and *b*) and fibrous or cartilaginous coalition of the same bones of the left foot (Fig. 9*c* and *d*). "Fuzziness" of the subtalar joint is more noticeable on the right side than it is on the left. Figure 10*a* shows the calcaneonavicular coalition at the time of operation. Triple arthrodesis was performed, utilizing metal staples for fixation (Fig. 10*b*). Figure 11*a* and *b* shows the roentgenographic appearance of the foot six months after the operation. Nine months after

(Continued on Page 1103)

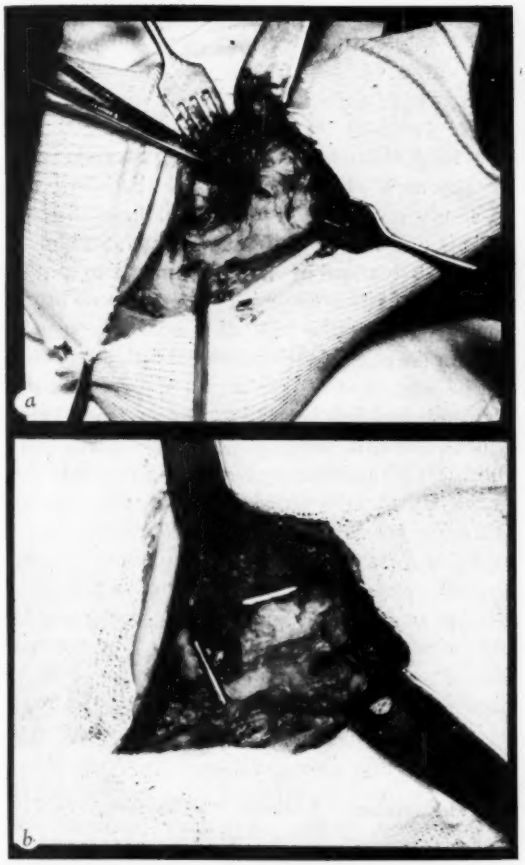

Fig. 10*a*, Calcaneonavicular bar filling "sinus tarsi" of right foot in Case 4; *b*, triple arthrodesis has been performed with metal staples and bone chips.

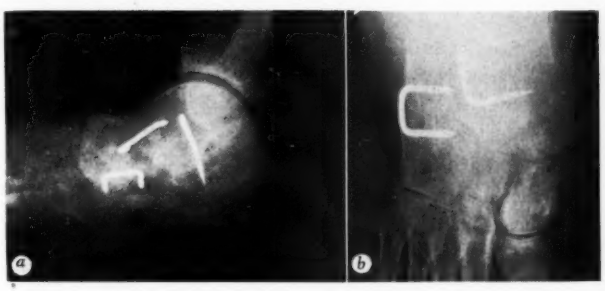

Fig. 11*a* and *b*, Lateral and anteroposterior roentgenograms of right foot made six months after triple arthrodesis in case of calcaneonavicular coalition (Case 4).

THE COMMON HEMORRHAGIC DISEASES OF CHILDHOOD

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THE pediatrician is probably less certain in his approach to the hemorrhagic disorders than to almost any other group of childhood diseases. This is due largely to the inadequate and impractical presentation of the bleeding diatheses in standard textbooks, which in turn can be accounted for by the lack of a sound concept to explain the physiology of hemostasis.

The control of hemorrhage is so perfected that abnormal bleeding is relatively uncommon. When it does occur, it is due to either one of two basic causes: (1) a defective hemostatic response following injury of a blood vessel, or (2) a hyperpermeability of the capillaries. The first is generally the result of faulty coagulation or more explicitly of an inadequate formation of thrombin. The second is due probably to one or more unknown agents or factors that affect the permeability of the capillaries. Blood is lost by diapedesis and it manifests itself as purpura, which involves principally the skin and mucous membranes.

Hemorrhagic Disease Due to Defective Coagulation

It is now being gradually recognized that the coagulation mechanism consists of at least three separate steps or reactions which can be expressed by the following equations:

Thromboplastinogen + platelet activity = thromboplastin
Thromboplastin + calcium + labile factor + prothrombin = thrombin
Fibrinogen + thrombin = fibrin.

It is important to emphasize that one important reaction not expressed in these equations is the labilization of platelets by thrombin which brings about a chain reaction designated as the thrombinogenic cycle. The lysis of platelets is not only essential for the formation of thrombin, but it also is responsible for the liberation of a vasoconstrictor which the writer considers the key agent in hemostasis. Whenever the formation of thrombin is diminished to the critical level, a bleeding tendency develops. The most important causes of decreased thrombin production are lack of platelets, thromboplastinogen, labile factor or prothrombin. On this basis a simple classification of the common hemorrhagic diseases due to defective coagulation can be outlined.

I. Hypothromboplastinemia
  A. Thrombocytopenia
  B. Hypothromboplastinogenemia
    1. Congenital (hemophilia)
  C. Anti-platelet activator.
II. Hypoprothrombinemia
  A. Congenital
    1. Type 1 (diminished free prothrombin)
    2. Type 2 (diminished free and total prothrombin)
    3. Type 3 (diminished labile factor)
  B. Acquired
    1. Dietary deficiency of vitamin K
      a. Hemorrhagic disease of the newborn
      b. Diarrhea
    2. Faulty absorption of vitamin K from intestine
      a. Congenital atresia or absence of biliary ducts
    3. Toxins (dicumarol, salicylates, et cetera)

Thrombocytopenia

Since deficiency of platelets is generally associated with purpura, it will be discussed under that heading.

Hypothromboplastinogenemia (Hempohilia)

Thromboplastinogen which is the precursor of thromboplastin is a constituent of the plasma. Normally its concentration is sufficient to supply enough free thromboplastin to activate most of the prothrombin of the blood. By measuring the prothrombin remaining in the blood after coagulation under standardized conditions, the concentration of thromboplastinogen can be quantitatively estimated. This procedure is called the prothrombin consumption test.

In hemophilia a congenital lack of thromboplastinogen is present at birth and apparently remains unchanged throughout life. In severe hemophilia, only a trace of this clotting factor is present in the blood, whereas in the milder cases the concentration is higher but still below the minimum requirement for effective hemostasis. Changes in the apparent severity of the disease

From the Department of Biochemistry, Marquette University School of Medicine.
Read at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota, June 13, 1950.

and the occurrence of bleeding episodes do not appear to be caused by changes in the basic defect, but by a secondary factor such as an alteration in the vascular response which is superimposed on the primary deficiency.

On the basis of this concept of hemophilia, both the diagnosis and treatment can be rationalized. In the past the diagnosis depended on a history of heredity, a prolonged coagulation time and a bleeding tendency. Since a positive family history is obtainable only in about one-half of the cases, and since the other two findings are not specific for hemophilia, it is easy to see that the diagnosis was far from exact; and since the clotting time in mild hemophilics is only slightly prolonged many cases assuredly remained undiagnosed. With the development of the prothrombin consumption test which measures the amount of prothrombin remaining in the serum after coagulation, a specific diagnostic procedure for hemophilia became available. This test measures the available thromboplastin of the blood. When normal blood clots, little prothrombin remains in the serum; whereas when hemophilic blood clots, little thromboplastin is available and therefore little prothrombin is consumed; hemophilic serum as a consequence still contains a high concentration of prothrombin. In severe hemophilia the serum prothrombin time is as low as eight seconds and the hemophilic range is eight to fourteen seconds whereas the normal range is eighteen to thirty seconds.

A low prothrombin consumption time with a normal platelet count and a normal plasma prothrombin time, makes the diagnosis of hemophilia almost certain. The one important condition which is not ruled out is the hemophilic-like disease which is caused by the presence of a plasma factor which apparently inhibits the platelet activator of thromboplastinogen. This disease which is rare in childhood will be briefly discussed later.

The nature of the bleeding tendency in hemophilia is helpful in the diagnosis. Abnormal bleeding following circumcision should immediately arouse suspicion, and a persistent tendency to bruise always deserves careful study. Characteristically these bruises in hemophilia are actually small hematomas. Only when these hematomas are superficial, do they discolor the skin. The deeper hematomas can only be palpated and they are occasionally mistaken for abscesses.

The severe case of hemophilia with a positive family history and a markedly prolonged coagulation time offers no diagnostic problem; but the mild case, with a negative family history and a coagulation time that is nearly normal even when done meticulously, could not be diagnosed with any degree of certainty until the prothrombin consumption test was developed. But it is the mild case that deserves particular attention since such an individual may without warning have severe hemorrhage from even a minor operation such as a tonsillectomy or the extraction of a tooth. Furthermore, a hemophilic, no matter how mild, transmits the defect to all his daughters and the severity of the disease in their offsprings is unpredictable.

The treatment of hemophilic bleeding should be guided by the basic fact that these patients rarely die from exsanguination but that the pressure effects from internal bleeding accounts for nearly all the injurious results. The bleeding usually comes from arterioles and small arteries.

The immediate therapeutic approach is local, and the important measures are cold, pressure and rest. Cold, preferably an ice bag, should be applied immediately after injury. By this means, the vessels in the injured area become contracted and the blood flow becomes diminished, thereby producing conditions favorable for stanching. Pressure likewise is exceedingly helpful in limiting bleeding; in fact, it appears fairly certain that most hemophilic bleeding is eventually stopped by the pressure exerted by the hematoma on the injured vessel. Complete rest obviously is indicated. It should be emphasized and re-emphasized that heat should never be applied to the area of bleeding, for it causes dilatation of blood vessels which accentuates the hemorrhage. One must be guarded in not mistaking a hematoma for a deep infection and then treating it with a poultice and heat.

By means of prompt local treatment hemarthroses may often be aborted or minimized. Much of the crippling in hemophilia can be prevented, but this requires education of both the physician and the parents. The treatment of deformed joints can often be benefited by physicotherapy.

The only known reliable systemic treatment is blood transfusion. By this means thromboplastinogen, which the hemophilic blood lacks, is supplied, and the hemostatic efficiency is temporarily increased. Transfusions are far more efficient prophylactically than curatively. In fact

a patient properly prepared with a large plasma transfusion may undergo major surgery without abnormal bleeding. Fresh plasma is preferable to whole blood since it is twice as effective and can be given repeatedly and in large volumes.

Transfusions should not be given indiscriminately, but only when local measures have failed or when a patient is prepared for an operation. There is suggestive evidence that transfusions may cause the formation of an inhibitory agent in the blood which apparently acts on the platelet activator. The condition thus produced will be discussed in the following section.

Hemophilic-like Disease

The disease is very similar to hemophilia clinically as well as regards laboratory findings. The coagulation time is prolonged and the prothrombin consumption time is low. The disease can, however, be readily distinguished from true hemophilia by determining the effect on the clotting when the blood is mixed with an equal volume of normal blood. A mixture of normal and hemophilic blood will have a normal clotting time, while an equal mixture of hemophilic-like blood and normal blood will have a delayed clotting time. The disease is caused by a factor which inhibits the platelet activator of thromboplastinogen. As stated before, transfusions may cause the condition, and recently it has been found that plasma fractions are even more prone to induce the formation of this so-called "circulating anticoagulant." The disease is important because the hemostatic defect cannot be corrected by transfusions. It becomes necessary therefore in studying hemophilic blood to determine what effect it has when mixed with normal blood. Hemophilia may be complicated by the coexistence of hemophilia-like disease, and when this occurs transfusions have no therapeutic efficacy. Fortunately the hemophilic-like disease is rare in children, and its production can be minimized by avoiding the injection of plasma protein fractions, and by giving blood or plasma transfusions only when urgently needed.

Hypoprothrombinemia

Deficiency of prothrombin may be congenital or acquired. There are three known types of congenital hypoprothrombinemia. To explain how this is possible, it is necessary to discuss briefly the new concept of the prothrombin complex. In human blood prothrombin is present partly in a reactive form and partly in a precursor state. Only free prothrombin can be converted to thrombin and this requires its interaction with thromboplastin, calcium and an agent discovered by the writer in 1943, which he named labile factor. This substance is closely related to prothrombin, and for convenience can be considered to be part of the prothrombin complex. In one type of congenital hypoprothrombinemia, both the free and total prothrombin levels are low; in the second the free prothrombin is diminished but the total is normal; while in the third the labile factor is deficient. Clinically these three conditions are very similar to hemophilia but can readily be distinguished by the prolonged prothrombin time. None of the three responds to vitamin K, but all can be temporarily corrected by blood or plasma transfusions. Since the labile factor is destroyed by storage, only fresh blood or plasma should be employed in treating the third type. The bleeding can often be controlled by the local measures which are effective in hemophilia.

The most important acquired type of hypoprothrombinemia for the pediatrician is the hemorrhagic disease of the newborn. The fetus is far more susceptible to vitamin K deficiency than the adult, and if the mother's nutrition is defective, the newborn child often develops a marked hypoprothrombinemia during the first few days of life. During this period the baby is a potential bleeder protected only by the intactness of its vascular system. Any trauma may precipitate a hemorrhage which may lead to dire results if prompt combative measures are not immediately instituted. A plasma transfusion becomes effective immediately, and vitamin K given intravenously restores the prothrombin level in four hours. By supplying the mother with a few cents worth of vitamin K during the last week or two of pregnancy, the hypoprothrombinemia of the newborn can be almost completely abolished. It is a pity that a few physicians belittle the efficacy of vitamin K. Anyone who has seen a fullblown case of hemorrhagic disease of the newborn saved only by prompt and heroic measures is willing to use vitamin K prophylactically even though only one baby in ten thousand may require this measure.

Obstructive jaundice, which is an important cause of hypoprothrombinemia in the adult, often

causes little or no decrease of the prothrombin level of infants. The writer has seen a number of babies with complete atresia of the biliary ducts and complete absence of bile from the intestines for months without a significant drop in the prothrombin level. In persistent diarrhea vitamin K deficiency may occur. The use of antibacterial agents which sterilize the intestinal tract may accentuate the lack of vitamin K.

Certain drugs depress the synthesis of prothrombin and cause a drop in prothrombin sufficiently marked to cause a bleeding state. The most common group of compounds having this prothrombinopenic action are the salicylates. By improving the nutritional state of the child this danger can generally be averted. There is no justification for using a salicylate preparation fortfied with a synthetic compound having vitamin K activity.

Hypoprothrombinemia in childhood is not common, but the possibility that it may occur should never be ignored. Whenever there is a possibility for its occurrence, a prothrombin time determination will furnish the correct answer. The study of any bleeding condition is not complete unless this test is done. Therapeutically it is well to remember that vitamin K is only effective if a deficiency of this vitamin causes the bleeding condition. In all other conditions of hypoprothrombinemia, plasma or whole blood transfusions only are effective.

Thrombocytopenic Purpura

Purpura is one of the most common forms of hemorrhage in childhood and one of the most difficult to cope with. It seems fairly clear that there are two separate but closely related components that account for the hemorrhagic state. The two are the lack of platelets and a vascular factor. Thrombocytopenia alone does not cause a purpuric condition. On the one hand, one sees repeatedly in cases of lymphatic leukemia a platelet count of 10,000 or less with no signs of purpura and a normal bleeding or tourniquet test. On the other hand, purpura with typical petechiae may appear with a normal platelet count. Bleeding as a rule is more severe in thrombocytopenic than in non-thrombocytopenic purpura. It seems logical to conclude that the purpura is due to a vascular factor, the nature of which is not understood. If there is a co-existence of thrombopenia, a coagulation defect is superimposed, since the activation of prothrombin is very incomplete when the platelets are low.

The recognition of thrombocytopenic purpura offers no difficulties, but the vexing problem is finding the cause. Probably the most common occurrence is as a complication of an infectious disease, and frequently the severity of the latter bears no relation to the intensity of the purpura. A mild case of rubella or chicken pox may induce a pronounced thrombocytopenic purpura with profuse bleeding. Blood dyscrasias, especially acute leukemia, are often complicated by purpuric bleeding. Allergy and drug sensitivity can cause purpura, and it appears that the emotional state may have some influence. Depression of bone marrow causes a fall in the platelet count. In addition to these secondary purpuras, a number of cases remain in which no specific cause can be found. These are designated essential, primary or idiopathic.

The treatment of thrombocytopenic purpura remains uncertain. The majority of cases recover spontaneously. Usually transfusions are given, but other than restoring erythrocytes and hemoglobin, probably little benefit is obtained. In a few cases, the writer has found that folic acid appeared to diminish the bleeding tendency without affecting the platelet count. Toluidine blue and protamine are disappointing in acute thrombocytopenic purpura.

When to do a splenectomy remains a moot question. Since a spontaneous and permanent recovery is frequent in children, the removal of the spleen should never be considered impetuously. To be sure, it is a serious responsibility to manage a case of thrombocytopenic purpura since the possibility of a spontaneous cerebral hemorrhage is ever present, but it is to be remembered that a splenectomy in the acute stage is likewise not without danger. Before a splenectomy is performed, all possible causes should be ruled out, a period of several weeks allowed to see whether a spontaneous recovery may occur, and a careful bone marrow study be made. If the marrow is aplastic, no benefit need be expected from the operation.

Since the bleeding in non-thrombocytopenic purpura (the Henoch-Schönlein types) is usually much less of a problem than the other symptoms, no special measures generally are necessary to

(Continued on Page 1165)

DEPROPANEX IN POST-SURGERY

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R. L. PARSONS, B.A., M.D., Triumph, Minnesota

SINCE before the last war, the writers have been routinely using the deproteinated pancreatic extract, Depropanex, post-surgically. As is well known, this drug is used in cases where smooth muscle spasm is present. In renal colic where it has been used for a considerable time it, in conjunction with other sedation, has been observed by some to produce great relief. What prompted us to try Depropanex post-surgically was the observation that, before Depropanex was administered in renal colic, there was a very distressing paralytic ileus present; following Depropanex injections, this condition was very shortly improved and relieved. It was so impressive to us that we then wondered what Depropanex would do in patients with the same distressing condition following abdominal operations. We therefore decided to give Depropanex routinely to all our patients following operations. The first injection of 4 c.c. is given the surgical patient upon his return to his room, even before he is awake. A second dose of 4 c.c. is given in the evening. These two doses of Depropanex are then given routinely twice daily for three to five days, depending upon the progress and the condition of the patient, as well as on the type of operation performed. A patient having only the appendix removed may not need the Depropanex more than twice daily for three days, while one who has had both gall bladder and appendix removed is usually given Depropanex for four to five days. The same applies to other major abdominal operations.

Now that approximately a decade has passed during which time we have used Depropanex post-operatively, we feel that the results have been so uniformly encouraging that it warrants a report on what we have experienced. Before we go into the details of what we have observed, we wish to state that we have been most fortunate in having an anesthetist who was trained for a year at the University of Minnesota Hospitals in Minneapolis. The anesthesia she has used almost exclusively for induction is Penthothal Sodium, followed by Cyclo-Propane gas. Curare has also been used to overcome peritoneal spasm and tension.

In acute gallbladder colic, Depropanex in conjunction with sedation has been found to be efficacious in relieving the spasm, pain and distress, as it does in renal colic. Following gallbladder surgery, it is reasonably safe to assume that Depropanex will reduce the spasm in the common duct as well as in the sphincter of Oddi. Relieving this spasm will, in turn, relieve the bile back-pressure created in the liver, ducts, and on the cystic stump. This relief of spasm, with resultant early flow of bile, is definitely an adjunct in the smooth recovery of the patient. The diminution of nausea and vomiting in these cases leads us to conclude that Depropanex is the aiding factor in this smooth post-operative recovery.

But the outstanding improvement we have observed on patients routinely given Depropanex post-operatively has been the control of paralytic ileus. The abdomen remains uniformly soft all through the critical post-operative days. When gas pains begin, the patient states that the pain will travel along in the bowel as if he had taken a laxative, and the gas pain never becomes distressing. There does not appear to be any noticeable abdominal distention; the abdominal wall does not feel tense nor rigid; the distressed facies is absent; the patient tolerates sips of water and invariably impresses us as being comfortable. When an enema is given on the third day the nurses report good results, while rarely do they have to use a rectal tube to siphon off the enema. On various occasions we have stopped the Depropanex to observe what takes place. The following day the patient will complain of distressing gas pains, but when we give Depropanex again, the gas pain soon becomes relieved and begins to move on in the bowel.

The above results have led us to speculate on the physiological action of Depropanex. It is advertised as relieving spasm. But we are wondering whether, if it relieves spasm, it does not also supply the smooth muscle with something that brings about a normal tone and natural power which thereby overcomes the muscle weakness which may eventually lead to a paralytic bowel with resultant distention? This uniformly good tone to the bowel all through the post-operative period has led us to notice that there is less vomiting as well as less acute dilatation of the stomach which ordinarily follows all types of opera-

tions, especially the major ones. Rarely do we resort to the nasal suction apparatus, and since there is very little vomiting we do not need to resort to intravenous fluids. Since these two adjuncts have been practically eliminated in respect to these patients, it is an obvious economy to the patient, while the floor nurses are thereby given more time for their daily floor routine. The same is true for the time-consuming work and anxiety the paralytic bowel causes when repeated enemas must be given for relief, to say nothing of the distress the rectal tube and enemas cause the ailing patient. The rarity of these distressing complications naturally leaves the patient in a much-desired frame of mind during these post-surgical days. In fact, we have had some patients who have given us the impression by their silent looks: "When is the tough time following this operation going to strike?"

We encourage our patients to get out of bed as soon as possible post-operatively. Since they make such a smooth recovery, the distress by their so doing is not too great for them.

In summing up our observations on these patients to whom we have routinely given Depropanex following surgery, we have observed the following:

1. No ill after-effects from the use of Depropanex.
2. Practically a complete elimination of post-operative paralytic ileus.
3. Less nausea and vomiting; therefore, less dehydration and acute dilatation of the stomach.
4. A smoother, easier, more pain-free recovery; therefore, a less anxious patient.
5. Intravenous fluids seldom used; therefore, economy to the patient.
6. Nasal suction and repeated enemas eliminated; thus, less punishment for the patient.
7. Patients over fifty years make as smooth a recovery as do the younger ones.

We believe that the beneficial effect of Depropanex on patients throughout the post-operative period has been convincingly demonstrated.

Has this deproteinated pancreatic extract, Depropanex, been fully researched?

The authors are cognizant of the fact that others have found so-called "hypotensive" extracts such as Depropanex without demonstrable intrinsic therapeutic merit in the dosage and methods of administration recommended. (J.A.M.A., March 3, 1945, p. 522.) We are also informed of the fact that Depropanex has not been submitted to the Council on Pharmacy and Chemistry for approval. We have used this preparation, however, in post-surgery patients and feel it has been of definite therapeutic value. This report is made, therefore, in the hope that our experience may be of value to others.

FLATFOOT, WITH SPECIAL CONSIDERATION OF TARSAL COALITION

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the operation, the patient was walking on his right foot and was not having any pain on the right. It is anticipated that a similar operative procedure eventually may have to be performed on the left foot.

Summary

There are three main types of flatfoot. The most common is an asymptomatic flattening of the longitudinal arch. This is an individual characteristic. The two types of symptomatic flatfoot are relaxed flatfoot and rigid flatfoot. Recent advance in the knowledge of rigid flatfoot seems to indicate that in most cases the feet are rigid because of coalition existing between the calcaneus and talus or between the calcaneus and the navicular.

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THE ROENTGEN DIAGNOSIS OF SILICOSIS

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(Continued from the October Issue)

Pneumoconiosis and Silicosis Occurring in Various Industries

All of the roentgen manifestations that have been described above have taken into consideration the hypothesis that the lesions in many or all instances have been produced by free silica and modified by other dusts (contaminants). As stated before, it is probable that very few opportunities are afforded to study lung changes in which pure silica is the only dust present. One should therefore bear in mind that the manifestations of silicosis in the various industries are likely to be different. For instance, the roentgen findings in the slate and talc workers are likely to be different from those occurring in hard and soft coal miners. The roentgen findings may differ even in different foundries. In most instances it requires many years (six to fifteen) of exposure before one can demonstrate roentgen evidence of silicosis. The exceptions to this rule are classified under the head of "rapidly developing silicosis."

Rapidly developing silicosis has been described by Gardner.[27] When individuals are exposed to excessive quantities of finely divided silica, an unusual kind of reaction develops. The overwhelming deposits of silica seem to stimulate connective tissues in every part of the lung at the same time. The nodules are of microscopic proportions and in most cases there have been complicating infections.

I have seen a great many roentgenograms (some single, a few stereoscopic) of individuals who were diagnosed as having rapidly developing silicosis. In the advanced cases lobar consolidations, due largely to the superimposed infection, obscured the changes due to silicosis. In the earlier cases the roentgenographic manifestations were those sometimes observed in an interstitial type of pneumonitis of ill-defined shadows similar to that produced by a prominent pectoral fold. In a few cases in which I made roentgenoscopic observations, the costal and diaphragmatic excursions seemed to be limited. A number of the individuals that I saw had lost weight, were pale and dyspneic. Experience in this country was similar to that in England,[49] in that most of the fatal cases were associated with tuberculosis.

Another consideration having to do with silicosis is concerned with what might be called individual susceptibility. Physicians interested in this subject have noticed that not all individuals exposed to dust in the same industry, and apparently in the same manner, develop silicosis. Why such a difference is manifest no one knows. Many explanations have been offered, but none of them are completely satisfactory. Lanza[42] feels that the question of individual susceptibility has been overworked and is not as significant as the question of dust exposure (dosage). There seems to be a general agreement that when a tuberculous infection is present, the actions of the silica and the infection are enhanced.

Asbestosis

Asbestosis is the second of the recognized specific pneumoconioses. Since, however, its roentgen manifestations in no way simulate those occurring in silicosis, the criteria for its diagnosis are not reviewed.

Differential Diagnosis

Any exposition of the criteria applicable to the diagnosis of the specific pneumoconioses, and of silicosis in particular, must include other conditions which not infrequently make the problem of differential diagnosis extremely difficult. Some of these are so familiar as to require but brief mention; others, either because of their unusual interest or because of the frequency with which they are misdiagnosed as silicosis, will be considered in some detail.

First in order of consideration are the benign pneumoconioses, and second, the many pulmonary diseases productive of roentgen changes similar to those of silicosis but unassociated with the inhalation of dust.

The Non-specific Pneumoconioses

Under the heading "non-specific pneumoconioses," attention is directed to the pulmonary reactions resulting from the inhalation of all types of mineral dust which are incapable of stimulating within the lungs the development of progressive fibrosis. Anthracosis, siderosis, as well as the reactions to the inhalation of cement, gypsum, and the various silicates, with the exception of asbestos and possibly talc, are all included.

The alveolar phagocytes, regardless of the composition of the inhaled dust, tend to concentrate the particles within the lymphoid tissues of the lungs and mediastinum as well as in the areolar tissues about the perivascular lymphatic trunks. Excessive accumulations may excite a low-grade chronic inflammatory reaction which is non-progressive but which may be productive of small amounts of grossly invisible cellular connective tissue. The only secondary effect is the appearance of emphysema, microscopic in its proportions and of no clinical significance.[32] Roentgenographically there may be some increase in prominence of the normal linear pulmonic markings, but with the exception of those "roentgenologic conditions" productive of a pseudo-nodulation and resulting from the inhalation of inert but radiopaque dusts, no *specific* deviations from the normal can be identified. Increasing experience will doubtless lead to the recognition of others, but to date those in the latter category to receive consideration are baritosis, siderosis, and the changes occurring in silver polishers, and those due to the inhalation of tin oxide.

Baritosis, originally described by Arrigoni,[3] results from the inhalation of barium sulfate, and occurs chiefly among the baryta miners in Italy. I reported a small incidence among workers in a Pennsylvania plant.[55] In baritosis there is no respiratory incapacity, the only evidence of the presence of the mineral being the demonstration upon the roentgenogram of sharply circumscribed nodules evenly distributed throughout the lung fields.[56] Duplication of the condition in the experimental animal is unproductive of fibrosis, indicating that the nodulation demonstrable in roentgenograms results from the direct visualization of compact collections of radiopaque particles within the lungs.[32]

Siderosis, an analogous condition occurs as the result of a number of industrial processes, chief among which are electric arc-welding, metal-grinding, silver finishing, and possibly boiler-scaling. Collis,[8] in 1923, suggested that errors in the diagnosis of silicosis in iron miners might be made, due to the radiopacity of iron oxide. Subsequently, but without the benefit of clarifying pathological material, Doig and McLaughlin,[15] in 1936, reported the occurrence of fine nodulation in 6 of 16 electric arc-welders. In 1938, Enzer and Sander[18] described similar findings in 5 of 26 electric arc-welders, who had worked for an average of nineteen years using bare metal rods containing 99 per cent iron and 1 per cent free silica, and in one case presented necropsy findings to indicate that the roentgen changes were a direct consequence of the collection of radiopaque iron oxide particles within the lungs. Sander[69] states that Enzer has since obtained three additional and confirmatory autopsy cases.

In 1945, entirely similar roentgen findings were reported by Pendergrass and Leopold[56] in four of ten metal-grinders who had worked from twelve to seventeen years in a plant shown to be free of a silica hazard. The metal ground was used in the manufacture of bearings and was identified as chrome vanadium and chrome molybedenum tool-steel containing about 98 per cent iron, 1.8 per cent alloy, and 0.2 per cent silica. For the grinding process, artificial abrasive wheels, recognized as innocuous from the standpoint of a silica hazard and composed of bakelite, carborundum, and aluminum oxide, were used exclusively throughout the occupational lives of the affected persons.

More recently, the occurrence of identical roentgen findings in silver-polishers has been reported from England.[46] Quite pure and finely divided iron oxide in the form of either "rouge" or "crocus" is used in the final finishing of silver, and when applied to revolving "dollies" is productive of considerable dust, consisting primarily of iron oxide contaminated with metallic silver, the latter also being radiopaque. Four men, employed as silver-finishers for periods of twenty to forty years, were examined. Chest roentgenograms of all presented the changes to be described below, and a subsequent autopsy on one revealed only particulate collections of iron oxide with small amounts of silver within the lungs.

A similar condition has been described as occurring in boiler-scalers.[9,16,75] Here, however, there may be an associated silica hazard, the elim-

ination of which is required before the changes seen can be properly attributed to siderosis.

Pathologically, in siderosis there is gross evidence of pigmentation, the ferrous nature of which may be demonstrated by proper staining. Histologic sections show the pigment to be distributed chiefly in the perivascular lymphatics, the subpleural spaces and the interalveolar septa. It is the heavy accumulation in the perivascular lymphatics of the iron oxide pigment, in itself radiopaque, which accounts for the roentgen findings. At no time have any reactive phenomena, provocative of fibrosis within the cells, been described.

The pulmonary changes in siderosis, as reflected in the chest roentgenogram, cannot from the film alone be distinguished from those already described in detail as occurring in simple silicosis. They are, therefore, simple of definition and consist of discrete nodular densities distributed uniformly throughout both lungs, without hilar enlargement but in some cases with an associated reticulation resulting from an increased prominence of the linear markings.

Pseudo-nodulation due to inhalation of tin oxide has been reported by Pendergrass and Pryde[57] and Barták et al.[4] Pendergrass and Pryde recorded a case which had been studied by Dr. Hollis E. Potter of Chicago. The patient was a man, aged forty-five, who had worked at a single job of bagging tin oxide for fifteen years. There was no disability. The roentgenogram showed diffuse dense pseudo-nodulation throughout both lungs similar to that observed in baritosis and considered to be a benign pneumoconiosis. Chemical analysis of the tin oxide showed it to be 96.5 per cent tin oxide, while the remaining 3.5 per cent contained aluminum, iron, and sodium. No silica was found. Experimental studies of the material placed in a dog's lung and in phantoms showed that its density was sufficiently great to produce shadows equal to or greater than those produced by iron. The pseudo-nodulation produced by tin oxide is not to be confused with the pneumoconiosis reported in the tin miners of Cornwall;[35] the industrial hazard among them was one of silicosis.

It seems quite obvious that a detailed occupational history is fundamental to the differential diagnosis of silicosis and the pseudo-nodular types of the benign pneumoconioses.

Talc Pneumoconiosis

It has already been indicated that the silicates, with the exception of asbestos and possibly talc, belong in the category of inert dusts. Asbestos, a fibrous silicate, is productive of a specific pneumoconiosis characterized by the formation of a progressive interstitial pulmonary fibrosis. Talc, also a silicate, with certain physical characteristics in common with asbestos, requires more specific evaluation (Hobbs.[39]).

The available experimental evidence would indicate that talc alone is incapable of producing a progressive fibrosis.[31,38] The criticism has been advanced, however, that the inhalation experiments were of insufficient duration to define conclusively the effect of long continued industrial exposure, this latter being fundamental to the development of specific changes.[73] Siegal reports no case with less than ten years' exposure, but then records an incidence of 14.5 per cent "talc pneumoconiosis."

Roentgenograms are described as showing a bilateral diffuse haziness or "ground-glass" appearance, with some tendency to parahilar and subapical localization, and, in some cases, with the presence of an ill defined nodulation and/or conglomerate areas of fibrosis leading to a suspicion, as yet unproved, of underlying infection.[62,73] Siegal[73] further directs attention to an occasional right-sided predominance and to a rarely demonstrable blurring or "shagginess" of the cardiac silhouette, reminiscent of asbestosis. He also describes in detail the occurrence of "pleural plaques," long associated with the inhalation of talc.

The similarity of the described roentgenographic manifestations to those of asbestosis is quite striking, but the occurrence of an asbestosis-like reaction following prolonged industrial exposure to talc would seem unlikely. Further controlled investigation, designed to eliminate the possible complicating factors of quartz-contaminated dust and infection, is, however, imperative before concluding with finality that the roentgen changes are the reflection of a specific and progressive fibrosis, and that talc is the sole etiologic agent in their production. In this regard, it seems quite probable that the described coexistent nodulation may be silicotic in origin. In the reported autopsy cases[62] there had been other opportunities for the inhalation of dusts presumably contaminated with

silica, and in the mining of talc itself similar exposures have not been excluded.

Lung Changes Associated With Alumina Abrasives (Shaver's Disease)

This disease was first observed[71] in February, 1942, in a thirty-three-year-old man, who for a period of eight years was engaged in manufacturing an abrasive, the main ingredient of which was bauxite. Since that time Shaver[72] has observed thirty-four well-established and thirty-eight early cases of lung involvement associated with the industry.

Occupational History.[71]—The process involved has been in operation for years and was believed to be innocuous. No one before had been discovered suffering with unusual lung involvement resulting from or associated with their occupation.

The abrasive being manufactured is *corundum.* It is an aluminum oxide of great hardness which is used as an abrasive.

The processing is done in electric arc furnaces. The material being treated consists of a mixture of bauxite, iron and coke. The bauxite is ground and mixed with other ingredients and then shoveled into large metal pots. The electrodes are lowered into the pots and the material is fused at temperatures of approximately 2000°C. During operation dense fumes are elaborated. The fumes contain alumina and silica and other materials in a finely divided state ($Al_2 O_3$ 50 per cent and $Si O_2$ 35 per cent).

Symptomatology.—The symptoms are varied but *dyspnea* is the most outstanding. Sudden attacks of extreme breathlessness are frequently described. There is a history of cough and a frothy sputum.

In the advanced cases, substernal discomfort and tightness of chest, and occasional pleuritic type of pain is described. Weakness, fatigue and sleeplessness are associated with advancing dyspnea.

Physical Findings.—Most cases have weight-loss associated with a loss of appetite. The chest signs vary with the presence or absence of pneumothoraces. Cyanosis, limited chest expansion, harsh breath sounds, variable rales and tachycardia are some of the signs found.

Pathology.—Overwhelming fibrous tissue formation, alveolar wall thickening and profound emphysema are characteristic findings.

Roentgen Findings.—In well-established cases, a widened mediastinal shadow may partially obscure the shadows of the hila. The domes of the diaphragm are usually irregular. The domes may be elevated and tented. The distortions of the mediastinum and diaphragm become less marked and may disappear when pneumotherax occurs.

Lace-like granular shadows occur bilaterally in the upper halves of each lung, especially pronounced toward the hila. Conglomerate shadows are seen in the more advanced cases. In advanced cases, emphysematous blebs are seen. Pneumothorax, either unilateral or bilateral, and, with or without a pleural collection not infrequently occurs.

Vanadium Pentoxide

There is another industrial disease due to the *toxic effects of vanadium pentoxide.*[82] I have no personal experience with this but a short discussion is included for completeness.

Vanadium is a silvery white metal rarely encountered in its pure state. The ores are distributed mainly in Peru, South Africa, and Rhodesia.[82] The chief uses of vanadium are to raise the hardness and malleability of steel and to increase its fatigue-resisting properties. Vanadium pentoxide, a yellowish red powder, is used as an oxidizing agent in the conversion of naphthalene to phthalic anhydride and in place of platinum in the modified contact process of sulfuric acid manufacture.[82]

It had long been known that vanadium pentoxide dust would cause bronchitis among workers, but the full significance of the condition was not appreciated until the report of Wyers[82] appeared. He has observed at least fifty workers, men and women, some of whom showed reticulated shadows in the lower lung fields. It is not known whether these shadows are due to accumulation of dust in the air sacs or fibrosis. Vanadium workers complain of paroxysmal cough and pains in the chest, and have a tenacious sputum, which may be blood-streaked. They may develop emphysema. Other signs of the condition are those of systemic intoxication, which may be evidenced by diarrhea, anorexia, emaciation, visual defects, paralysis, vertigo, and convulsions.

Other and Confusing Clauses of Nodular Densities Within the Lungs

Tuberculosis.—Tuberculosis, following an hematogenous dissemination, presents on the roent-

genogram evenly distributed nodular densities throughout both lungs, occasionally indistinguishable from those occurring in simple silicosis. Except in these cases, difficulty in the differential diagnosis between tuberculosis and silicosis seldom occurs, but in them the distinction must be made upon the basis of history, physical examination, and laboratory findings. Frequently an additional aid is the identification, in tuberculosis, of an accompanying localized infiltrate or cavity, without, however, evidence of conglomerate fibrosis of the type already described as occurring in tuberculo-silicosis.

Histoplasmosis.—Darling,[10,11,12] in 1906 and 1907, recorded three cases of a generalized and fatal protozoan infection, subsequently identified as histoplasmosis, which produced pseudo-tubercles in the lungs and areas of focal necrosis in the liver, spleen, and lymph nodes. Further reports[7,41,50,52,66,67,81,83] in more recent years have shown the disease to be world-wide in distribution, but most common in the east-central portion of the United States; have adequately documented its pathology and clinical course; and have offered evidence in support of the thesis that it is not invariably fatal but that it in all probability exists most commonly in a benign and asymptomatic form. DeMonbreun[13] in 1932 proved its fungous origin by identifying *Histoplasma capsulatum* as the causative organism.

The symptoms of histoplasmosis, when it is clinically manifest, are protean, being those of a generalized infection of the reticulo-endothelial system, for which Meleny[47] suggests the name "reticulo-endothelial cytomycosis." Of primary interest in this presentation, however, is the 20 per cent[41] occurrence of significant lung lesions. In some of these the roentgen findings closely simulate those of pulmonary tuberculosis, consisting of apical infiltrations with or without cavity; in others, miliary lesions 5 to 15 mm. in diameter are evenly distributed throughout both lungs. It is these latter which may resemble silicosis, and make necessary the inclusion of histoplasmosis in the differential diagnosis of the nodular pneumoconioses.

Also, in the areas endemic for histoplasmosis, the incidence of "disseminated miliary calcifications" is relatively more frequent than in the country at large.[43] While in such cases the nodules characteristically vary slightly in size, are of irregular distribution, and lack an uncalcified periphery, their appearance is such that they may rarely require differentiation from silicosis with central calcification of the nodules.

The Mycotic Infections.—There are a number of conditions, such as fungus infestations, that may simulate the various manifestations of silicosis. One of the important points in arriving at the diagnosis is for the radiologist to bear these in mind. Some of the more frequent infestations seen by us are mentioned.

In *moniliasis,* in which the chief pathogen has been found to be *Monilia albicans,* the roentgenogram shows irregular areas of infiltration which tend to become nodular. The appearance is similar to that in simple silicosis with nodular predominance. Fawcitt[23] has called attention to finding bronchomycoses as a complication in hematite iron-ore workers.

Sporotrichosis is due to a Streptothrix. In the cases that we have observed, the appearance is identical with nodular silicosis.

The roentgen appearance in *actinomycosis* may be that of a bronchopneumonia. The process may be diffuse or localized to one lobe. It may be confused with silicosis with infection.

It is sometimes difficult to establish the true diagnosis of a fungus disease, but every effort must be made to exclude the lesions that simulate silicosis before making a definite diagnosis of the latter.

Pulmonary Hemosiderosis.—Pulmonary hemosiderosis clearly demonstrable in roentgenograms as diffuse nodulation,[2] similar to that produced by silicosis, is said to occur in some patients with mitral stenosis.[56,59,70] Scott,[70] in an excellent paper, has discussed the subject in detail and has shown, I believe, that hemosiderin is responsible for the shadows in the roentgenograms. In our patients there was a preceding rheumatic fever. The shadow pattern is similar to that produced by silicosis or the pseudo-nodulation of benign pneumoconiosis.

Polycythemia Vera.—Polycythemia vera in patients with cyanosis and vascular engorgement may present a markedly increased prominence of the vascular shadows in the lung. Vessels seen in an axial plane simulate the nodulation found in silicosis. There are other shadows in polycythe-

mia vera of unknown origin which simulate the shadows produced by conglomerate fibrosis. The history, physical examination, and blood count will assist in the difierential diagnosis.

Carcinoma of the Lung.—Carcinomatous metastases may resemble the nodular and conglomerate shadows of silicosis with and without infection. Primary carcinomas arising in the gastro-intestinal tract and kidney tumors account for the great majority of such metastases, but carcinomas arising from other sites may be responsible. Here again the history and clinical findings should assist greatly in determining whether a malignant process is responsible for the abnormal shadow pattern.

Recently we have had two cases that were diagnosed primary carcinoma of the lung on the basis of a roentgen finding of an isolated mass shadow within one lung. There was a history in each instance that the patient was a hard coal miner for years. The only clinical history of significance was hemophysis. In one patient the lung lesion was due to a carcinoma, in the other, silicosis.

Mediastinal Enlargement.—In many silicotic patients, there are massive shadows that coalesce with the mediastinal shadow. On the single posteroanterior roentgenogram, the appearance simulates that produced by lymphoblastoma. I have no doubt that many of these patients have been treated for a malignant process. These massive shadows adjacent to the mediastinum, may be due either to massive lesions in the apices of the lower lobes or to massive lesions in the upper lobes which have migrated to the mediastinum.

Boeck's Sarcoid.—Boeck's sarcoid is primarily a systemic disease, classically presenting widespread involvement of the lymph nodes, viscera, osseous system, and skin. Commonly, however, its clinical manifestations occur in various combinations, leading to its separation into types, as the uveoparotid fever of Heerfordt and Mikulicz's syndrome. Similarly, there is a fairly large group —seventeen in Reisner's series of thirty-five cases[64]—in which associated lymphadenopathy and pulmonary involvement constitute either the most conspicuous or the only discernible manifestation.

The manifestations in chest roentgenograms are in turn extremely variable as to extent, distribution, and character, depending largely upon the phase of evolution of the disease process at the time of examination. For convenience of description, and without implication that the process is at any time static, both Reisner[64] and Bernstein[5] have subdivided the roentgen findings into several types. In attempting to identify the various forms of the disease, a free use of both classifications is made.

1. In some cases the only abnormality demonstrable on the roentgenogram is a bilateral, usually symmetrical enlargement of hilar and tracheobronchial lymph nodes.

2. The so-called "miliary sarcoidosis" is characterized by the presence of widespread nodular densities throughout the lungs which are usually quite uniform in size and distribution, but may at times exhibit a moderate tendency to coalesce and be most dense in the middle thirds. Commonly there is easily demonstrable hilar lymphadenopathy but, depending upon the phase of the disease, this may or may not be present.

3. A third group includes those cases in which there is hilar lymphadenopathy together with a string-like infiltration radiating outward from the hila into the pulmonary parenchyma. These string-like shadows appear perivascular in distribution and may be combined with a generalized nodulation such as has already been described.

4. A fourth type presents roentgenographically diffuse parenchymal infiltrations visualized as well demarcated but irregular and often contracted areas of increased density, having the appearance of fibrosis. Hilar lymphadenopathy is a variable finding, as is an associated background of increased linear markings and nodulation.

In all forms of this disease the pathological lesion is the non-caseating tubercle. The clinical course, however, is variable though inevitably chronic. The first and second types above described may represent an early and reversible stage, and both show a pronounced tendency to resolution. King[40] has reported complete clearing within an average of twenty-two months in twenty-three of thirty-seven cases of pulmonary sarcoidosis, but does not specify the type of involvement. In the third and fourth types the changes are at least partially irreversible. Some degree of resorption may occur, but there inevitably remains a residuum of increased linear markings and at times a massive contracting fibrosis. The latter leads to varying degrees of

disability, and in some cases to a fatal termination, the commonest causes of which are the development of or transition into a typically caseating pulmonary tuberculosis or the development of cor pulmonale.[34,64]

The roentgen appearance of Boeck's sarcoid and certain of the pneumoconioses, including silicosis, is occasionally identical. The nodulation in the miliary form may be indistinguishable from that of silicosis and the pseudo-nodular types of the benign pneumoconioses, and the late fibrous reactions may rarely simulate the picture of tuberculo-silicosis. In all such cases, the differentiation rests upon a critical evaluation of the historical, clinical, and laboratory data. The distinction, however, is usually not difficult, since in sarcoidosis one is commonly led to the correct impression by the presence of marked lymphadenopathy, by irregularities in the distribution and character of the pulmonary lesions, or by the presence of other and extrapulmonary lesions.

Chronic Pulmonary Granulomatosis in Beryllium Workers.—The recognition of a new pulmonary disease appearing in workers engaged ir certain industrial processes requiring the use of beryllium, or one of its compounds, is attracting increasing attention. This condition may present in the roentgenogram a pattern strikingly similar to that seen in silicosis. Affected individuals have, as a rule, been employed in the manufacture of fluorescent lamps, fluorescent powder, neon signs, or beryllium copper alloys, or have been engaged either in the extraction of beryllium from the ore or in projects of a research nature requiring the use of its compounds.

At least two rather distinctive and entirely different reactions have been described. The first of these, with which Van Ordstrand and his associates[76] in Cleveland have had the widest experience, is an acute chemical pneumonitis. Its roentgenographic characteristics, however, are entirely different from those of silicosis and require no elaboration in a discussion of the differential diagnosis.

The second type of reaction, recently labeled at the Sixth Saranac Laboratory Symposium as "chronic pulmonary granulomatosis occurring in beryllium workers," has been well described by Sosman and Wilson in a report from Hardy and Tabershaw,[36] by Pascucci,[52] and more recently again by Wilson,[80] and by Robert.[68] Its roentgen manifestations are extremely protean and for adequate description require some attempt at classification. As a consequence, two[53] or three[36] types or stages—granular, reticular, and nodular —are recognized. Granting the possibility that the various bizarre forms of the disease may represent different phases in its evolution, subdivision into types rather than stages would seem wiser until more extended observation enables us to detect a certain general pattern in the developmental cycle. To date, in most cases one is unable to demonstrate a distinct transition from one form to another, and there is no clear-cut gamut of stages through which any given case must pass. In contradistinction, there is some indication, as yet meager, that the types now recognized are all late manifestations and that, prior to the development of chronic granulomatosis, there may be a preliminary and perhaps transitory stage comparable to the acute form but so mild in degree that it escapes recognition.

In all types, the involvement is diffuse throughout both lungs. The granular form presents a generalized stippled or "fine sandpaper" appearance suggestive of pulmonary edema, but closer inspection demonstrates that the changes are distinctly particulate in nature. There is usually no accompanying hilar node enlargement. In certain instances this granularity may serve as a background for a generalized reticulation, comprising the reticular form of Sosman and Wilson.[36] In these there may be an accompanying slight to moderate enlargement of the hilar lymph nodes.

The nodular type, which is of primary concern in the differential diagnosis of silicosis, is characterized by the presence on the roentgenogram of evenly distributed nodular densities throughout the lungs. These vary from 1 or 2 mm. to 4 or 5 mm. in diameter in different persons, but in a given case are generally uniform in size. The tendency to coalescence is usually not well defined, although in some cases there may be a quite definite concentration of the nodulation in the upper lung fields. The hila are frequently indistinct, and may be the site of a pronounced lymphadenopathy.

At the risk of digressing, a brief résumé of the symptoms and clinical course of this so recently recognized disease is offered. Dyspnea, cough, and weight loss, together with a long latent period varying from months to several years prior to

onset, are cardinal features. A study of the ventilatory function in advanced cases reveals marked respiratory incapacity, which is in turn regularly accompanied by a secondary polycythemia. Hardy and Tabershaw,[36] report a mortality rate of 35 per cent, but the outcome is not invariably fatal, and some of those cases which it has been our privilege to follow have remained relatively stationary over a period of several years, while others have shown varying degrees of improvement. Too short a time has elapsed to warrant final conclusions, and the ultimate result to be expected in the non-fatal cases is still a matter of conjecture. In any given case, however, attention should be directed to the fact that there is apt to be a striking lack of correlation between the clinical and the roentgen findings.

In autopsy material there is grossly apparent a diffuse thickening of the alveolar septa, usually most marked in the hilar portion of each lobe. Microscopically this is seen to have occurred secondary to a widespread cellular infiltration by macrophages and lymphocytes, with the associated formation of focal lesions in which there has been an obliteration of the alveolar spaces. Multinucleated giant cells of the Langhans' type are usually demonstrable, and the irregular deposition of fibrous tissue within the lesions is a common occurrence.

As long as the granularity so characteristic of the granular and reticular forms of the disease persists, the differentiation of the various nodular pneumoconioses from chronic pulmonary granulomatosis of the type seen in beryllium workers does not present a difficult problem. In the nodular form, however, the roentgen appearance may simulate exactly that of siliocisis and those benign pneumoconioses which exhibit a nodular predominance. In these cases recourse must again be taken to the occupational history and to consideration of the clinical and laboratory findings.

Comment

The remarks above are but a brief account of the story of silicosis and some of the conditions with which it may be confused. There are many avenues of research concerning silicosis still to be explored. The new work of Evans[19] in this country and Barták et al[4] in Italy may provide new approaches to this exceedingly important subject. Every year brings new answers to old problems and new problems to be answered. Until we know the answers to all of the problems concerned with this subject, it behooves us to plan for the worker. Such a plan should include the following requirements:

1. A healthy atmosphere in which individuals work.

2. Preemployment and annual physical and roentgen examinations of the chest in order to demonstrate early tuberculous lesions and exclude such individuals from participating in work that may be harmful to them and their fellow workers.

Summary

1. Attention is directed to the fact that a fluoroscopic and roentgenographic examination of the chest is the most precise method available for demonstrating in the living individual the pathological changes produced within the lungs by the silicosis. The necessity, however, for correlating the roentgen findings with all other essential data before making a definite diagnosis is emphasized.

2. The roentgen manifestations of simple silicosis and of silicosis complicated by the presence of coexisting infection, are detailed. The demonstration upon the roentgenogram of a generalized nodulation throughout the lungs is considered as fundamental to tht diagnosis of silicosis.

3. The differential diagnosis of silicosis and other conditions which may be productive of nodular densities within the lungs is reviewed.

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Case Report

INFANTILE CORTICAL HYPEROSTOSIS

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IN July, 1945, Caffey and Silverman[3] made a preliminary report of four cases with a syndrome they designated infantile cortical hyperostosis. We wish to report another case believed to be of the same clinical entity.

Case Report

M. R., a baby girl, was born at term on January 4, 1950, after a normal spontaneous labor and weighed 7 pounds 2½ ounces. The gestation was accompanied by a mild hyperemesis on the part of the mother in the first five months with consequent dietary restrictions. The last four months antepartum were uneventful and without disease.

The infant was healthy and gained normally the first three months at home. Ascorbic acid and Drisdol had been added at one month. At three months the child was noted to be very irritable and anorexic. Soon thereafter, the parents noted a swelling of the right cheek. There was no known fever at this time. In spite of penicillin therapy, the hyperirritability and mandibular swelling persisted for nearly one month, then receded.

Before the mandibular swelling had disappeared, the irritability and anorexia again returned, followed by swelling of the right forearm.

The infant was first seen at our office on July 27, 1950, which was a few days after the left forearm had noticeably enlarged. The mandibular swelling was scarcely palpable, whereas the forearms were tensely swollen and tender. There was no hyperemia or discoloration of the areas involved. They were not fluctuant.

The child moved her arms slowly and infrequently. She cried when the swollen areas were palpated. Examination of the heart and lungs was negative. The spleen and liver were not enlarged. There was no adenopathy. Rectal temperature was 100.4°F. There were no palpable abnormalities of the thorax or lower extremities.

Laboratory examination revealed a hemoglobin of 55 per cent with 3.03 million red cells. The white count was 11,800 with 33 per cent polymorphonuclear cells, 60 per cent lymphocytes, 4 per cent monocytes and 3 per cent eosinophils. The urine was normal. Sedimentation rate was 8 mm. per hour by the Westergren method. Serology and Mantoux (1:1,000 dilution) were negative. Serum calcium was 9.8 mg. per cent and phosphorus was 5.6 mg. per cent. Alkaline phosphatase was 23.0 King-Armstrong units. Blood ascorbic acid level was .99 mg. per cent.

Roentgen examination revealed massive hyperostosis in the bones of both forearms and moderate hyperostosis of the right mandible. There was no other area of involvement discovered from complete skeletal films. Lung fields were clear and heart size normal.

Mandible films of a three-year-old sibling were also normal.

As of November 9, 1950, the previous areas of hyperostosis have returned to normal size without specific treatment.

Comment

The clinical features, laboratory data and x-ray findings of the case conform with those of cases presented by Caffey and Silverman[3] and Smyth, et al.[12] Basic features are hyperirritability, fever, and roentgenologic evidence of external thickening of the cortex.

This syndrome is usually manifest during the first three or four months of life with the mandible most often the primary site of involvement. From there the distribution and magnitude of swellings varies greatly.

More recently Caffey[2] reported two cases which developed during the second year of life (eighteen months and twenty months). Neither of these young children had mandibular hyperostosis. Of a total of twenty-seven cases reported, the average age of onset is the twenty-fifth week.

The cause and pathogenesis remain undetermined. Bacterial infections, scurvy, rickets, trauma and neoplastic diseases appear to be excluded as causal agents.

Infection as an etiology, is supported by leukocytosis, fever and, in some cases, elevated sedimentation rate, but treatment with the sulfonamides or the antibiotics has met with no significant response. Ross et al[4] reported blood cultures and febrile agglutinations to be negative in ten cases. They also had complete virus studies by the National Institute of Health which all proved negative. Tuberculosis is ruled out by a negative Mantoux and roentgenological findings. Similarly syphilis is ruled out by serology. Also, biopsy specimens have not supported infection as a causal agent but simply show hyperplasia of normal lamellar bone.[10] X-rays fail to show similarity of this syndrome to scurvy or rickets. There is an absence of a zone of rarefaction beneath the epiphyseal line leaving the terminal segments of the shaft unaffected. Also, the age at onset, adequate vitamin C intake and lack of response to cevitamic acid speak against scurvy.

No noncomitant blood dyscrasias have been reported.

Neoplastic disease is ruled out by absence of sarcomatous lesions in reported biopsy specimens and the benign course followed by all reported cases.

Shuman[11] found the disease refractory to antihistaminic preparations and allergy elimination diets.

Delano and Butler[5] report a case occurring within ten days after a smallpox vaccination and postulated that infection was the basis somewhat similar to that of osteomyelitis variolosa. In most of the reported cases, however, there has been no history of antecedent vaccination or immunizations.

There was no evidence of a hereditary factor in this case or previous reported cases except for that of Van Zeben[15] who suggests the possibility in a description of three patients in one family with typical periosteal lesions.

Sherman and Hillyer,[10] in an extensive review of the syndrome in February, 1950, found only twenty-seven

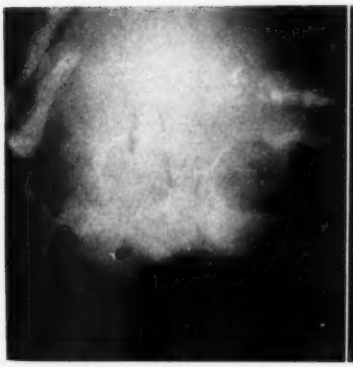

Fig. 1. Showing thickening and increased opacity of right mandible.

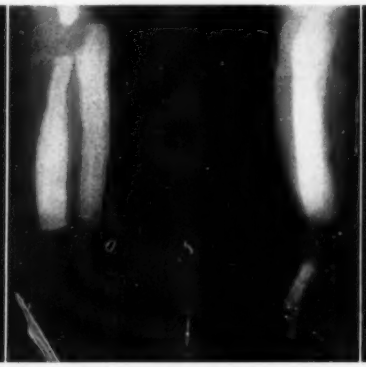

Fig. 2. X-ray of right forearm showing a thickening of both radius and ulna.

Fig. 3. X-ray of left forearm showing a marked thickening of left ulna alone.

cases reported, of which fifteen were males and twelve were females. There was no preference of race or geographical location. They postulated that the initial disturbance was of the muscle tissue with secondary stimulation of periosteum. Supporting their theory is the lack of periosteal inflammation or hemorrhage and presence of vascular changes and degeneration of overlying muscles.

The soft tissue changes causing tenderness and pseudoparalysis appear to be limited to the muscle groups adjacent to the involved bones and do not extend to the subcutaneous layers.

The sites of predilection seem to be the mandible, clavicles, scapulae, extremities and ribs. Associated with rib involvemment is pleural thickening. Whipple[4] reported a case with the more infrequent site of hyperostosis in the calvarium.

In the absence of any known specific treatment, it is fortunate that all reported preceding cases have run a benign although protracted course to complete recovery. Treatment is symptomatic only. There are frequent remissions and exacerbations during the progress of the disease. However, complete recovery may be expected in three to six months.

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THE RADIOACTIVE EFFECTS OF ATOMIC WEAPONS

(Continued from Page 1087)

radiation sickness. It must be recalled, however, that radiation sickness is responsible for only a small percentage of the deaths occurring after or at the time of a bomb blast. Sixty per cent of the Japanese deaths were said to be from blast, thirty per cent from burns and only ten to twenty per cent to radiation sickness. Much work is being done on blast and burns. so that it may be anticipated that if better methods of treatment for these injuries are at hand, a larger percentage will survive these injuries and the effects of radiation sickness will be more apparent.

Recommended for Supplementary Reading

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History of Medicine In Minnesota

MEDICINE AND ITS PRACTITIONERS IN OLMSTED COUNTY PRIOR TO 1900

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(Continued from the October Issue)

Alexander Grant (1825-1907), of Scotch descent, was born and reared on a farm in New York. He acquired an excellent academic education, studied medicine for a time at the University of Michigan, and in 1858 was graduated from the Buffalo Medical College, of the University of Buffalo, New York. Shortly afterward he again came west and, after teaching school and practicing medicine in Wisconsin, arrived in High Forest, Olmsted County, in 1859, and there established himself as a physician. He was to remain for twenty-two years. Record indicates that he perhaps came in the hope of improving his health in Minnesota's much advertised climate, for in 1864 he was exempted from military service because of "feeble constitution," and in 1866, appointed as enrolling clerk to the state senate, he was obliged to resign because of ill health.

In the middle sixties, on the failure of Coe and Huddleston, pioneer merchants of High Forest, Dr. Grant bought their stock of goods and thereafter kept a general store as well as practiced his profession, but with less emphasis on medicine as years went by. Other physicians, O. Chase, S. V. Groesbeck, W. G. Bothwell and D. S. Fairchild, came and went between 1866 and 1873. In 1869 Dr. Grant built a two story frame building on the west side of the village green, a structure imposing for the time and place. His store and living quarters were on the ground floor; the large room above became the lodge room of the High Forest Masons. From then well into 1945, when it was razed, the building was known as the Masonic Temple. The mercantile business prospered and for a time in 1872 the doctor published a four-column advertising sheet, the *High Forest Illustrated Sensation,* describing his stock, a publication that the *Rochester Post* praised as a readable and spicy budget of business.

Of keen intellect and scholarly tastes, Dr. Grant was interested in music, literature and floriculture. He wrote and spoke well, was public-spirited, and took active interest in all matters of local enterprise and welfare. He not only organized patriotic celebrations, but was in demand throughout the county and beyond its borders as an eloquent speaker at community meetings, patriotic, political and agricultural. Although he commonly talked extemporaneously, some of his addresses were prepared; namely, certain ones on rabies and hydrophobia, the life and services of Horace Greeley, and the life of Abraham Lincoln. The *Rochester City Post* of July 13, 1867, carried in full his Fourth of July Oration of that year.

A devoted Republican, he was a member of the local central committee and regularly was a representative from the township to the party conventions of county and district. He was an organizer and the secretary of the local National Loyal League, in 1863, and an active member of the local Grant (Ulysses S.) and Wilson Club in 1872. Until 1875 he served as a petit juror of the United States District Court in St. Paul.

For some eight years he was known in medical circles, as a member of the

Olmsted County Medical Society from 1868, and of the Minnesota State Medical Society from 1872 through 1876. He was admitted to the state society together with Dr. G. W. Nichols, of Rochester, and Dr. A. W. Stinchfield, then of Dundas, at a meeting held in Rochester on June 11 and 12, 1872, during the presidency of Dr. W. W. Mayo.

Dr. Grant has been described by an early resident of High Forest who knew him well, as a short, slight, wiry man, of medium coloring and keen gray-blue eyes, who wore a small mustache and short side whiskers that terminated in a small goatee. His invariable formal costume was a suit of pepper-and-salt worsted with black velvet collar and cuffs, worn with a white collar and black tie. As time went on, certain eccentricities in his manner of living and a disregard of the niceties in his bachelor housekeeping became ingrained. In later years, when the doctor had removed to Dakota, an old friend from High Forest stopped off to see him. He was living in a dingy little general store. The combination heating and cooking stove in the center of the room was surrounded by the traditional basebox filled with sand, and the sand was covered with little heaps of coffee grounds and egg shells; the doctor told his caller that he cleaned it up periodically. In High Forest, although the citizens were amused by his peculiarities, they had affection for him and respect for his intellectual attainments.

In the summer of 1880 Dr. Grant made his first trip to Dakota Territory and in the autumn of 1881 he left permanently for the "Jim River country." After a few years in Groton, Brown County, he moved a few miles west to Bath, in the same county, where he spent the remainder of his life. He registered as a physician in Dakota on December 10, 1887, then in Bath. He died in 1907; he had never married.

George A. Gustine, a graduate physician and surgeon of some years' experience, came to Rochester, Minnesota, with his wife and children from Saratoga Springs, New York, in May, 1881, primarily to benefit his health and to visit his relatives who were established here. Liking the place and the climate, he entered medical practice, at first having his office and residence in rooms on the second floor of the Heaney Block, on Zumbro Street, over G. Stocking's Crockery and Glassware Store. Later the residence was on Grove Street. In April, 1882, Dr. Gustine returned with his family to Saratoga Springs.

Dr. Gustine was one of the seven children of Francis Gustine and Sophrinia Sexton Gustine, who for many years were respected citizens of Rochester. Mr. and Mrs. Gustine were pioneers in New England, living first in Winchester, New Hampshire, and later in Medford, Massachusetts; subsequently they were in Luzerne, New York. From Luzerne they came to Minnesota in 1879 accompanied by several of their children. A son, Levi S. Gustine, spent his life in Rochester and is survived by resident children and grandchildren. A daughter of Mr. and Mrs. Francis Gustine, who was married to A. D. Twiss, in Luzerne, came with her husband to Plainview, Wabasha County, in 1880 and to Rochester in 1881; survivors of Mr. and Mrs. Twiss in the city are a daughter, Mrs. C. M. Judd, a son, A. G. Twiss, and four grandchildren. A younger daughter, Sadie Gustine, was married in Rochester in the eighties to Nevin C. Pollock. Mr. and Mrs. Pollock, after eleven years in Evansville, Minnesota, returned to Rochester and lived there the remainder of their lives. They were survived by three children, all of Rochester: Madge (Mrs. Vernon) Gates (since deceased), Laura (Mrs. Frank C.) Jacobs, and Dr. Lee W. Pollock (1887-1947), of the staff of the Mayo Clinic.

John Haggard (1809-1875) was one of the earliest physicians in southeastern Minnesota, briefly in Olmsted County, near Rochester, in late 1856, and in that year and for some time subsequently at Fairpoint, Cherry Grove Township, Goodhue County, across the border from Concord, Dodge County. Biographical notes about him properly belong in a story of early medicine in Goodhue County; because information regarding him did not come to light until late in 1947, several years after notes on physicians of Goodhue County had been published, a brief sketch appears here. The writer is indebted to Dr. George D. Haggard, of Minneapolis, a nephew of Dr. John Haggard, for helpful response to her inquiry.

John Haggard, born on October 30, 1809, in Madison County, Kentucky, was the eldest child of David Haggard, a farmer, and Elizabeth Gentry Haggard, who came from a prominent Kentucky family. Both Mr. and Mrs. Haggard were of English extraction. They and their thirteen children were Baptists; later they all became Disciples of Christ. From Kentucky David Haggard moved with his family, in 1839, to a farm home two miles north of Peosta, Iowa, in Dubuque County.

In giving something of family history Dr. George D. Haggard wrote: "My father and mother, David and Mary Haggard, came to the Territory of Minnesota in November, 1856, stopping first near the present location of Rochester. While her husband turned back of necessity, she waited there in a tent with her three boys, with an axe at hand on the tent flap. The wolves serenaded her for three nights." When the husband returned, he was accompanied by his brother, Dr. John Haggard, who went on with the family to Fairpoint, Goodhue County; in that little community several other families, of Haggard brothers, and sisters, soon settled. There, in January, 1857, the doctor officiated at the birth of his nephew, George D. Haggard (the fourth child in a family of ten) who was born during a raging blizzard, in a log cabin that as yet lacked a roof. Mary Haggard, her son recalled, "had considerable skill in the use of herbal remedies and in the cure of the sick. She answered the calls of her neighbors on the frontier but did not consider herself a practitioner nor did she charge for her services." In those days there was much freighting from Red Wing and Pine Island, and David Haggard had the fastest team of oxen in his community. During his residence at Fairpoint he was postmaster, under President Buchanan. This family in 1862 returned to Iowa and in 1863 settled in Eau Claire, Wisconsin. In 1893 George D. Haggard was graduated in medicine from the University of Minnesota and in that year began his long practice of more than fifty-five years in Minneapolis.

About his uncle, Dr. G. D. Haggard continued:

> I do not remember my Uncle John. I do not know about his academic and professional training, but he was a man of ability and integrity. He practiced in Fairpoint and vicinity in 1856-1857 (perhaps longer), and made a number of amputations because of frozen hands and feet in that severe winter.
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> Dr. Haggard, according to his sister, Nancy Haggard Smith, was in the Black Hawk War. Two younger brothers, Thomas and James, were in the Civil War; the father in the War of 1812; and the grandfather in the War of the Revolution.
>
> His oldest son, David, who died in 1931, spent his latest years in Algona, Iowa; one of the doctor's grandsons, John W. Haggard, son of David Haggard, is editor of a newspaper there, the Algona *Upper Des Moines*.
>
> Dr. John Haggard was married to Elizabeth Lyman on February 27, 1837, and to Irena Shaw in 1849. He died on February 18, 1875.

L. Hall was listed in the *Minnesota State Gazetteer and Business Directory* from 1880 through 1885 as a physician of High Forest, Olmsted County.

Actually the Reverend Levi Hall came to High Forest some time in 1878 as a

Methodist clergyman. In 1879 he became one of the instructors at the High Forest Seminary, a Methodist school of merit in its day.

Born in Delaware County, Ohio, on October 26, 1833, the son of a farmer, Levi Hall obtained a college education and at the age of twenty years became an ordained minister and revivalist. He was one of the original circuit riders of southern and southeastern Ohio. In 1872 he was transferred to the Minnesota Methodist Conference, and in the next years served pastorates at Austin, Minneapolis, Litchfield, Dover and High Forest.

In his circuit-riding days he often found it necessary to give aid to the sick, and the need for such treatment and his natural aptitude for healing led him to study medicine privately for many years. In 1881, then in his forty-eighth year, on taking superannuated relations in his conference (*A History of the Methodist Episcopal Church in Minneapolis and St. Paul.* By the Rev. J. Wesley Hill. 1895.), he determined to complete his medical education. He enrolled that year at the Hahnemann Medical College of Chicago, from which he received his degree of doctor of medicine in 1882; a fellow graduate in the same class was his son, Dr. Pearl M. Hall. Dr. Levi Hall returned to Minneapolis, where he had established his home in 1881, and in that city for the next thirty years he was a well-known and respected physician. He died at his home on March 22, 1911.

H. H. Herzog was the sixteenth appointee, as an assistant physician, on the staff of the Rochester State Hospital, in Rochester, Minnesota. A graduate of Rush Medical College in 1893, he came to Rochester from Minneapolis, where he had been serving as an intern at St. Mary's Hospital, and entered on his duties on December 1, 1893.

After he had been six months in Rochester, it was announced in the local press that Dr. Herzog had resigned his position to accept a similar place at the Wisconsin State Hospital for Insane at Mendota, Wisconsin. Apparently he changed his plans, since he continued for some years as a member of the hospital staff in Rochester. At a meeting of the Southern Minnesota Medical Association held at Rochester on August 1, 1895, Dr. Herzog was unanimously elected to membership; since a prerequisite to admission was membership in a local county medical society, it is assumed that he earlier had become a member of the Olmsted County Medical Society.

On March 27, 1899, Dr. Herzog resigned from the state hospital to enter private practice. Rochester newspapers commented that his home was in Racine, Wisconsin; that he would attend clinics at St. Mary's Hospital, Rochester, for a month; that he had been offered a position as lecturer at the Chicago Medical College but that he was doubtful about accepting because he was resigning to practice privately. "He is a physician of exceptional ability as well as one possessed of mental qualifications of no ordinary kind." In April, 1899, he went to Waterville, Minnesota, as locum tenens for Dr. O. M. Justice, who at one time had been an orderly at the Rochester State Hospital, with the idea of remaining in Waterville or of settling in Minneapolis.

Dr. Herzog is remembered well by citizens of Rochester. It is said that he died from angina pectoris. Probably his death occurred prior to 1906, since his name does not appear in the first edition of the directory of the American Medical Association, which was compiled in that year.

Oscar C. Heyerdale (1873——), who was born in La Crosse, Wisconsin, on May 6, 1873, has been (1950) a resident of Rochester, Minnesota, with the exception of one year, since he was eleven years old. Since 1898 he has been

a physician of Minnesota, and since 1899, of Olmsted County. The twenty-fifth appointee, as an assistant physician on the staff of the Rochester State Hospital, he began his work in the institution on July 13, 1899; from August, 1912, to July, 1937, he was assistant medical superintendent.

The parents of Oscar C. Heyerdale were born in Norway. His father, Hjalmar Heyerdale, was educated as a pharmacist in Oslo, came as a young man to the United States, and settled in La Crosse, Wisconsin. There he was married to Sophie Wilhelmina Emerson. Some years later he moved with his family to Blue Earth, Minnesota, where he owned and operated a drug store. In the summer of 1884, after her husband's death, Mrs. Heyerdale with her three sons, Elmer W., Oscar C. and Frederick, came to Rochester; she died in Rochester on July 19, 1926. Of the sons, Oscar, as stated, and Frederick became permanent residents of the city; Elmer W. Heyerdale, a pharmacist, in 1947 had been for many years in Minneapolis.

Oscar C. Heyerdale obtained his preliminary education in the grade schools and the high school of Rochester. Before entering on his medical training, he was for four years a clerk and assistant pharmacist at the Weber and Heintz Drug store in the city. After one year at the medical school of the University of Minnesota, he transferred to the medical department of Northwestern University, making the change on the persuasion of his friend and classmate, Henry S. Plummer, of Racine, Minnesota, who insisted that they both go to Northwestern to take advantage of the extensive clinical material and the excellent training available there. At that time Northwestern University was one of the few institutions in the country offering a medical course of four years. The two friends were graduated in June, 1898, in a class of eighty-six students.

Immediately out of medical school Dr. Heyerdale began his initial practice in Plainview, Wabasha County, in association with the well-known pioneer physician, Dr. Nathaniel S. Tefft. He received his Minnesota license on October 11, 1898.

At the end of a year's general medical and surgical experience Dr. Heyerdale accepted his appointment to the staff of the Rochester State Hospital. A memorable assignment early in his work with the insane resulted from an abrupt change in arrangements for returning two patients to their homes abroad, one to Norway, the other to Sweden; on one day's notice the young physician started with the two insane persons on an eventful trip of seven weeks and 13,000 miles.

After twelve years as physician in charge of the wards for women at the state hospital, Dr. Heyerdale became assistant medical superintendent, succeeding Dr. Robert McE. Phelps, resigned, and in this capacity he served ably for twenty-five years. Gradually failing eyesight over a long period ultimately caused his retirement, in July, 1937, from his official position and from the scientific field in which he had won distinguished recognition as physician and humanitarian.

Throughout his professional career Dr. Heyerdale has been active in medical organizations. While in Plainview he became a member of the Wabasha County Medical Society and the Southern Minnesota Medical Association. Soon after coming to Rochester he was enrolled in the Olmsted County Medical Society (was once its president), the Minnesota Southwestern Medical Association, the Minnesota State Medical Association, the American Medical Association and the American Psychiatric Association. He is a Mason, member of the Halcyon Chapter (Worshipful Master in 1907-1908, High Priest in 1911) and of the Knights Templar. He is a vestryman of the Calvary Episcopal Church. For many years he served on the Rochester Park Board.

On June 10, 1903, Oscar C. Heyerdale was married to Gertrude Wentworth, of Rochester. Gertrude Wentworth was born in Janesville, Wisconsin, a daughter

of William Cooledge Wentworth, a native of Madison County, New York, and Mary Elizabeth Moran Wentworth, a native of Jamestown, Ohio. Mr. Wentworth, at one time a railroad man, was for many years a hotel proprietor in various states of the Middle West and the West; for a few years prior to his death, in February, 1907, he lived in Spring Valley, Fillmore County. Mrs. Wentworth survived him thirty-two years and died in Rochester on September 21, 1939.

Dr. and Mrs. Heyerdale had three children, Elizabeth, who died in infancy in 1904, William Wentworth, and Louise. Dr. William Wentworth Heyerdale, a physician on the staff of the Mayo Clinic, served in World War II as a captain in the United States Army Medical Corps. He died on New Caledonia Island, in the South Pacific, on March 11, 1944; he is survived by his wife, Melanie R. Heyerdale, and three children, Melanie Anne, Sally and William S. Heyerdale. Louise Heyerdale (died, January, 1948) was married to Dr. William J. Martin (Lieutenant Commander, United States Navy, during World War II), of Louisville, Kentucky. Dr. and Mrs. Martin had three children, William J. Martin, III, Robert Heyerdale Martin, and Louise Wentworth Martin.

Mrs. Mary Hicklin, an eclectic practitioner, came to Rochester from Red Wing, Minnesota, in August, 1863. In her professional card, in the *Rochester City Post* of August 22, 1863, she announced to the public that she expected to treat all diseases with success, especially typhoid fever and dysentery; that she would treat all chronic diseases with electricity; and that she possessed one of Prof. W. P. Well's Electropathic Batteries. Her headquarters were at the Stevens House. It is assumed that her stay in Rochester was not long.

Alonzo Ward Hill (1851-1924), an early physician of Olmsted County, Minnesota, was born on December 7, 1851, near Logansport, Indiana, a son of Levi Pervine Hill and his second wife, Christena Tilden Hill. In 1856 Mr. and Mrs. Levi P. Hill came to southern Minnesota with their four children, John W., Alonzo Ward, Margaret and Sarah. In Dodge County, where they first settled, a third son, Benjamin Franklin was born. In 1860 the family established their home in Oronoco, Olmsted County. Early Oronocans have recalled that Mrs. Hill was a capable practical nurse, who gave much aid to the community in those years when physicians were few. Her father, William Tilden, practiced medicine in Ohio and in Peru, Indiana, and came to Minnesota in 1855; record has not appeared that he was a practitioner in this state.

In 1856 the Hill family had been pioneers for generations. John Hill, father of Levi P. Hill, was born in the East and came early to Indiana; his wife was Sarah Watt, who came to America with her parents, William and Unity Brown Watt, from Balygonney, North Ireland, in 1791 when she was three years old. John Hill was killed by a falling tree on his farm near Logansport, Indiana, on February 14, 1842, in his fifty-third year, and was buried in the churchyard of Spring Creek Christian Church, near Logansport; in the same plot are the graves of his daughter, Unity Melissa Hill Thompson, who died in 1860, and of his daughter-in-law (first wife of Levi P. Hill), who died in 1849. Some years after her husband's death Sarah Watt Hill joined her relatives in Oronoco, Minnesota; her grave is in the village cemetery.

Alonzo Ward Hill was educated at the village school of Oronoco and at the high school and Niles Academy in Rochester, as were other members of the family. After his graduation from the University of Michigan with the degree of doctor of medicine, in March, 1876, Dr. Hill spent a few months in Oronoco

before entering into medical practice in the village of Pickwick, Winona County. From Pickwick he removed to Pleasant Grove, Olmsted County, some time in 1878; in November of that year he was married to Mattie Doris Cox, daughter of Ferdinand Cox, pioneer merchant, in 1855, of Pickwick.

In Pleasant Grove Dr. Hill operated a drug store and for eleven years practiced medicine in the village and its surrounding community. In 1882 he served as county physician for his region; on May 7, 1884, he received his Minnesota State license, No. 900 (R), under the medical practice act of the preceding year. There have been noted occasional references to his activities as a delegate to Republican county conventions.

In the late autumn of 1889 Dr. and Mrs. Hill and their only child, Mabel Ione, departed for Oregon, where they lived first in Milton and subsequently in Freewater, returning to Minnesota occasionally on business. In 1913 Dr. Hill retired from medical practice to operate his drug store. He died at Freewater on June 26, 1924. His wife, Mattie Cox Hill, died on July 31, 1944. In 1945 the survivors of Dr. and Mrs. Hill were their daughter Mabel Ione Demory, six grandchildren and six great-grandchildren.

Edgar Augustus Holmes (1852-1897) was a physician and surgeon in Olmsted County from June, 1880, to April, 1888, for a few weeks in Eyota, his boyhood home, and for eight years in Oronoco.

Born on January 20, 1852, in Chilmark, Martha's Vineyard Island, Massachusetts, he was the son of Augustus Holmes and Almira Daggett Cottle Holmes. Augustus Holmes was a sea captain on one of the old time whaling ships and made long voyages, once from New England around the Cape and north to Alaska, that were sometimes years in duration. He did not see his son until the child was two and a half years old and then, family anecdote relates, the little boy said to his mother, "Who is that strange man, Mum?"

When Edgar Holmes was a small boy, the family immigrated to the vicinity of Sheboygan, Wisconsin, where the father became a farmer and the son attended the grade schools and the high school of the town. About 1868 a second remove was made, to Eyota, Olmsted County, Minnesota, and there at the age of sixteen years Edgar Holmes began teaching country school; in 1876 he was one of the three teachers in Eyota's new school building. After nine years of pedagogy he entered on the study of medicine under the preceptorship of Dr. A. W. Stinchfield, of Eyota, who in his long career inspired and helped many young men to qualify for the medical profession. In June, 1880, Dr. Holmes was graduated from the Chicago Medical College and returned to Eyota for a few weeks before going to Oronoco, where a practice was being held for him by his undergraduate classmate and roommate at medical school, William A. Vincent *(q.v.)*. On the death of Dr. John N. Farrand, of Oronoco, by drowning on June 23, 1880, Dr. Vincent, who was employed for the summer at the state hospital for insane at Rochester (later as assistant physician), hastened to hang out his shingle at Oronoco, both to serve the people and to hold the field for Dr. Holmes.

By August, 1880, Dr. Holmes was established in Oronoco with his wife and their two small daughters; a third daughter was born in Oronoco in 1887. He had been married in 1873 to Harriet Eckles, of Eyota, one of the thirteen children of William Eckles, who originally was a skilled shoemaker, and Mary Ann Pears Eckles, early pioneer farmers in the township. Mr. and Mrs. Eckles and two small children came from Yorkshire, England, to America in 1850 by sailing vessel, a tedious voyage of twelve weeks and of many hardships. They settled

first on a farm near Ripon, Wisconsin; there Harriet Eckles was born on May 4, 1854; two years later the family came by wagon to a homestead claim in Eyota Township.

In Oronoco Dr. Holmes had an arduous practice of medicine, surgery and, occasionally, dentistry, under all the difficulties of the time, in a territory that soon extended as far as Genoa and Greenwood Prairie in Olmsted County, and to Elgin and Mazeppa in Goodhue County; for a while in the late eighties he maintained an office two days a week at Mazeppa. Early in the Oronoco years his office was in James Barnett's drug store; later and for the greater period, in his own residence. In surgical emergencies his wife sometimes acted as his assistant.

Dr. Holmes has been described as a tall, well-built man weighing 213 pounds, of medium coloring, with curly brown hair and clear gray eyes, and pre-eminently as kind, sympathetic, quiet, dependable, tolerant and charitable. He won confidence and affection and, although he refused public office except as a member of the school board, it is said that the community never was more united than in the years that he was a resident of Oronoco. He neither smoked nor drank; his temper was always under control; if he said something was "cussed," it was recognized that matters were serious. He and his wife were members and generous supporters of the Presbyterian Church and for some years Mrs. Holmes was superintendent of the Sunday school. The doctor was a member of the local Masonic lodge and of other fraternal organizations. In the late eighties he was for several years co-editor of the *Pine Island Journal*, of Goodhue County.

Dr. Holmes held the esteem of the medical profession of county and state as a physician of ability and integrity. He was an active member of the Olmsted County Medical Society, the Minnesota State Medical Society (from 1882; elected third vice president in 1886) and the American Medical Association. Among his contributions to the medical literature was a paper, "Lithaemia," which he read on November 9, 1886, before the county society. It was published in the *Northwestern Lancet* of December 1, 1886; the original manuscript remains in the possession of his family. During much of his residence in Oronoco he served as county physican in Oronoco, New Haven and Farmington Townships. He was licensed in Minnesota on January 10, 1884, receiving certificate No. 679 (R).

On April, 1888, because of better professional and financial opportunity, Dr. Holmes removed to North St. Paul to enter partnership with Dr. Nathaniel S. Lane, who from 1882 to 1888 practiced medicine in Eyota; after 1894 for some years Dr. Lane was in Winona. Oronoco, in July, 1888, advertised for a good doctor at an early date; in December Dr. Charles Q. Scoboria, from Elk River, settled in the village.

After nine useful years as citizen and physician in North St. Paul Dr. Edgar A. Holmes died on August 8, 1897. He had been in failing health since 1895, when he had suffered a paralytic stroke. Mrs. Holmes lived to the venerable age of ninety years and died at her home in North St. Paul on May 23, 1944. One daughter Stelle Mabel, had died in 1889. In 1946 there survived two daughters, Myra May (Mrs. Edward) Michel, of North St. Paul, and Lulu Irene (Mrs. Roy) Allis, of Oronoco, four grandchildren and two great-grandchildren.

(To Be Continued in the December Issue)

President's Letter

ARMS AND THE MEDICAL

Post-Korean problems and the continuing war of preparedness require that the medical profession assume a heavy share of responsibility in the months and, perhaps, years ahead.

Never before, in the history of our country, has it been found necessary to pass a special law, providing for the registration, classification and induction of physicians and other allied specialist groups; but Public Law 779 is now on the statutes, by Presidential Proclamation of October 10. Minnesota's first registration, October 16, brought some 400 names on the Selective Service list, and future registrations, slated to be held before January 16, 1951, will bring in hundreds more of prospective draftees.

A chain of advisory committees, beginning with the National Advisory Committee, appointed by the President, has been established. The National Committee, in turn, appointed state advisory committees and, in Minnesota, the state advisory committee requested the Minnesota State Medical Association to establish a central committee and for each county medical society to establish a committee.

The county medical society advisory committees are to serve as liaison groups with local selective service boards, as well as to advise these boards regarding individual classifications and the policies established by the National Advisory Committee.

In outline, this chain of advisory groups will operate in much the same manner as Procurement and Assignment procedures of World War II.

If the system is to prove efficient and in the best interests of each community, the state as a whole, and the profession, it will require the co-operation of every physician.

Questionnaires have been mailed to registering physicians and these are being returned to the State Office for referral to advisory committees. Facts about the physician and the community he serves will have a bearing on his classification. Complete information will aid these committees in giving the greatest assistance to the military services without impairing the health of the civilian populace.

President, Minnesota State Medical Association

Editorial

CARL B. DRAKE, M.D., *Editor;* GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

REGISTRATION AND INDUCTION OF PHYSICIANS

PHYSICIANS as well as laymen can be excused for their lack of enthusiasm for exchanging their civilian life for the military. Those who served during the war and had their normal peaceful lives disrupted have the feeling they have done their duty and are loath to don the military after a mere five years of civilian re-establishment. Those who have never served having also been loath to volunteer a program had to be developed which would be as fair an apportionment of a distasteful job as was possible. Those who have never served are to be called first and those in the reserve last—as far as is reasonably possible. The present plan seems as equitable as possible although there are bound to be inequalities develop here and there.

On October 16 physicians (and dentists) who had obtained their medical (and dental) education through ASTP or V-12 or who were deferred for educational reasons and who had had less than twenty-one months of service were required to register.

According to newspaper reports 113 physicians registered in Hennepin County, forty-one in Ramsey, ninety-seven in Olmsted (Rochester), nine in Cook (Duluth) and one in Blue Earth County (Mankato) on this date.

The World War II system of procurement and assignment of physicians has been revived, and each state will have its committee composed of a physician, dentist and representative of the state public health department (the physician to be chairman) to work with the National Advisory Committee in the selection of doctors, dentists and allied specialists in Washington.

Those who received their training at the expense of the government and who have served less than ninety days are First Priority. Those who have served more than ninety days and less than twenty-one months are classed as Second Priority. Although both First and Second Priority groups registered, the First Priority will be processed first. Registration dates for all other physicians under fifty and not in military reserves will be sometime before January 16, 1951, and will constitute a future priority.

Indications are that inductions will not be made in large numbers until late in December, and registrants will be allowed twenty-one days to settle personal affairs before being inducted.

Fewer World War II reserves than anticipated will be called into active duty within the next few months and these for only three or four months in most cases rather than for the full twenty-one months. World War II reserves will be utilized only until non-veteran replacements can be mustered into service and it is said that an effort will be made to return veteran reservists to civilian life as fast as possible. Exceptions to this relaxed policy will be certain senior officer specialists and senior command and staff officers whom it will be difficult to replace.

The army is undertaking to offer a reserve commission to every registrant at the time he takes his physical examination and before his induction. Further, physicians can volunteer for any military service before they are inducted and receive the $100 monthly bonus pay which goes with volunteers.

This seems to be the present status as to Uncle Sam's requirements of the medical profession. What the future weekly bulletins will contain or what the future will require is unpredictable. One thing is certain. We must arm for defense on such a scale that none will dare attack us. If the enemies of free people eventually see the futility of living in a world armed to the teeth, we shall all be able to revert back to a peaceful footing.

GOOD DOCTORS AND BAD MEDICINE

IT should be unnecessary to state that the most important function of the American Medical Association is the preservation of the nation's health. The Association endeavors to carry out this objective in many ways. Probably the most valuable of these is protection of the public against exploitation of remedies that are worthless or of

doubtful value. This function is carried on by the Council on Pharmacy and Chemistry which carefully investigates the therapeutic value of all drug products submitted to them. If a therapeutic product is found to meet the claims made for it by the producer, it receives the Council's seal of approval and the drug is so advertised in official medical journals. This would seem to be a simple and practical way to protect the public by guiding the physician in selecting drugs of proven merit. One might expect that the medical profession would be unanimous in supporting the AMA in this most important activity. Sad to relate, however, this is not the case.

Although most state medical journals advertise only those drugs which have been approved by the Council of the AMA, there are several state and county medical associations which do not. In fact, in some of these medical journals a large part of their advertising columns is taken up with unapproved remedies. The reason for this is obvious. Instead of balancing the budget of state and county medical societies by adjusting membership dues, the officers stoop to accept income from questionable advertising in their medical journals.

Advertising of pharmaceutical products that are not accepted by the AMA is not confined to state and county medical journals. The official publications of several national societies also contain many pages of sub-standard advertising. In recent numbers of the official journal of a well-known society, more than 60 per cent of the advertisements were unapproved by the AMA. Even more reprehensible is the fact that this same medical organization permits the display of these doubtful remedies in the commercial exhibits at its annual meetings. The contrast between information offered by excellent scientific articles in some of these journals and misinformation contained in the advertising pages should arouse the callous editorial conscience.

There are also the so-called "throw-away" medical journals. These periodicals are printed by commercial publishers who distribute them gratis to members of the medical profession. They depend entirely upon their advertising columns for income. It is no wonder that they are lucrative since their pages are filled with ads of remedies unapproved by the AMA as well as some that are so shady that even lay newspapers might hesitate to accept them. Members of the medical profession are lured to read these journals by means of handy abstracts of recent medical papers dished up in attractive form or by articles on economic problems of medical practice. One might expect the intelligent physician reader would disregard doubtful advertisements. The astute publishers know, however, that the medical reader fails to distinguish the approved products from the unapproved and falls for catchy advertisements just like his lay brother.

One of the phenomenal developments of our time is the enormous number of new drugs and therapeutic agents that are constantly being offered to the physician by drug manufacturers and by research laboratories. Some of these products have the therapeutic merit claimed for them by the producers; others do not. Some are definitely harmful and these should be so labeled before they are put on the market. The need for an impartial and disinterested authority to examine new drugs and verify the claims made for them by the manufacturers is self-evident. The AMA generously assumed this function at no little cost to itself by creating the Council on Pharmacy and Chemistry in 1905. The Council consists of seventeen outstanding scientists and a full-time secretary. It has an extensive chemical laboratory available in AMA headquarters. In order to expedite their investigations and render their decisions more accurate, the Council has been aided in recent years by a representative group of specialists called the Therapeutic Trials Committee. The members of the Council work without remuneration and have faithfully carried out their responsibilities over the years at a great sacrifice of time and effort on their part.

The average physician does not realize how much the Council has done to raise the standard of American medicine to its present high level. It is constantly offering practical as well as scientific information concerning every new pharmaceutical product that has therapeutic value. It has been responsible for many special articles, giving a summary of wide clinical experience. It has embodied this mass of information in several books such as "New and Non-official Remedies" and others. The Council also has encouraged research for new and better therapeutic products. In fact, it has been the stimulant for the outstanding research carried on in many scientific laboratories including those of the American Pharma-

ceutical Industry. It may well be said that the work of the Council alone would justify the existence of the American Medical Association.

Let us see first if there is any logical reason why approval of drugs by the Council on Pharmacy and Chemistry should be disregarded. Is it true, as has been claimed, that legitimate products have been turned down? Is it true that the delay sometimes caused by thorough examination of a drug is unfair to its manufacturer? Is it necessary to depend on the Council for investigation in order to determine the value of a drug? Would not the experience of a practitioner who employed the drug be of equal value? These are some of the critical questions put by commercially minded medical organizations and by manufacturers of unapproved products. Although formerly there was some delay on the part of the Council in completing its investigation of a product, that has been corrected. Prolonged delays almost invariably are due to failure on the part of the manufacturer to submit sufficient data to substantiate their claims or that are necessary to carry on investigation. A product which is submitted with necessary information can be accepted by the Council within a period of six to ten weeks. In fact, if necessary, the Council can complete consideration of a drug within two or three weeks. The claim that the limited personal experience of a practitioner, without laboratory control, is just as good as the thorough clinical and laboratory investigation made by the Council, aided by a group of experts in the field involved, is of course ridiculous.

Many of the larger and well-established producers of pharmaceutical products co-operate with the Council and abide by its rules in obtaining acceptance of their new preparations. In fact the American drug industry deserves great credit for the scientific methods employed in the manufacture of their products and for the high standards of research conducted in their laboratories. Unfortunately, however, there are many members of the drug industry who do not abide by the Council's rules of acceptance. In fact, the group of drug manufacturers who flagrantly disregard the Council's efforts are increasing in number and in influence. Aided by officers of medical societies who place profit above principle and by throwaway medical journals, they find that they are able to bootleg their wares successfully. Unless their efforts are blocked, they threaten to undermine the work of the Council.

There are many loyal members of the AMA who recognize the need and value of the Council and yet they sabotage it by prescribing unapproved drugs. There are physicians with outstanding professional reputations who allow their names to appear on editorial boards of medical journals which are loaded with advertisements of unapproved drugs. Other outstanding physicians allow their names to be listed as officers of medical associations that sponsor such journals. These men are used as fronts, and in that capacity they indirectly lend endorsement to the character of the journal including the advertising pages.

The medical profession can limit traffic in uncertified drugs by refusing to prescribe any drug that does not have the seal of approval. The officers of transgressing medical associations, the editors, the scientific contributors, and even the subscribers to mercenary medical journals should scrutinize the advertising columns, and if unapproved drugs are displayed, they should register their objections. A wide-spread movement of that kind would soon correct the misleading and mercenary advertising now published in many medical journals. The public would approve of such action and it would be a tremendous boost to our public relations. Such action also would be of great aid in starting a sadly needed house cleaning in the advertising columns of the lay press and in the radio. These lay transgressors can point in defense to similar conditions now existing in the advertising pages of medical journals. The medical profession must proceed immediately to clean its own house. It can do so by two ways: by prescribing only those pharmaceutical products that are certified by the Council and by forbidding advertisement of unapproved drugs in its medical journals.

WILLIAM F. BRAASCH, M.D.

LUETIC AORTITIS

ATTENTION has been called of late to another sign which is apparently quite diagnostic of luetic aortitis. Jackman and Lubert were the first to call attention to the significance of a linear appearing calcification in the ascending aorta in the x-ray film. It has been shown by these authors,[1,2] and others[3] that a large percentage of individuals showing this type and location of calcification have luetic aortitis.

It is known that lues has a predilection for the root of the aorta. Whether the calcification in this area represents a healing of the luetic process in this area or is a sequel of an arteriosclerotic process in this area initiated by syphilis is not known and is perhaps not important. The important point in differentiation is that calcification accompanying simple arteriosclerosis appears blotchy in the x-ray film and is located beyond the root of the aorta.

While this linear appearing calcification in the root of the aorta is practically diagnostic of late syphilitic aortitis, its absence is not significant. In the presence of this x-ray shadow the diagnosis of syphilitic aortitis can be accepted until proven otherwise.

1. Jackman, J., and Lubert, M.: Significance of calcification of the ascending aorta as observed roentgenologically. Am. J. Roentgenol., 53:432, (May) 1945.
2. Jackman, J.: Syphilitic aortitis. Pennsylvania M. J., 53:972, (Sept.), 1950.
3. Leighton, R. S.: Calcification of the ascending aorta as a sign of syphilitic aortitis. Radiology, 51:257, (Aug.) 1948.

LESS SYPHILIS

THE report of the Committee on Syphilis and Social Disease of the Minnesota State Medical Association submitted to the House of Delegates at Duluth in June merits emphasis not only because it indicates a marked reduction in the incidence of syphilis in Minnesota in recent years but because it emphasizes one very important point in the medical care of syphilitics. All patients treated for syphilis should have a spinal Wassermann test performed during or at the conclusion of treatment. A spinal examination becomes a "must" for any patient whose blood Wasserman persists as positive after an adequate course of treatment or over a period of five years. This is, of course, the only way asymptomatic neurosyphilis can be diagnosed, and the importance of making the diagnosis lies in the fact that asymptomatic neurosyphilis can in many instances be successfully treated with penicillin. Such successful treatment obviates the necessity in these instances of long periods of hospitalization for tabes and paresis at a later date and constitutes a great saving financially for the state, to say nothing of a much better outcome for the patient.

The reduction in the incidence of syphilis in Minnesota during the past thirty years—the incumbency of Dr. H. G. Irvine as director of the Division of Venereal Diseases of the State Department of Health—is almost unbelievable and is a tribute to Dr. Irvine and his associates. In 1925 some 4,300 cases of syphilis were reported in the state. Since then the number reported yearly has shown a steady decline, except for an occasional increase, until last year when only sixty-nine cases of early syphilis were reported. Since 1940 the average number of new cases reported yearly has been 301, the higher than average number reported in 1946 being doubtless due to the return of the soldiers from the war.

On the other hand not enough spinal Wassermann tests are being performed. In 1948 a total of 488 latent or late syphilis cases was reported but only 202 had any record of a spinal fluid test. In 1949 out of a total of 422 such cases only 160 had spinal tests.

While there were thirty-one cases of congenital syphilis reported in 1949, only one of these was a child born in 1949, thirty having been born previous to that year. Only one congenital syphilitic out of 73,627 live births in 1949 is something to be proud of.

So satisfactory is the penicillin treatment of the disease in all its phases that the state is willing to provide this antibiotic for those unable to afford the cost. Office treatment to the extent of 3,000,000 to 6,000,000 units over a period of fifteen days is highly satisfactory and fully as effective as larger doses. The early treatment of syphilis is preventive in nature, and the assumption of the cost of medication by the state when the individual is unable to afford it is justified from a realistic standpoint.

SALINE SOLUTION IN TREATMENT OF BURN SHOCK

The Surgery Study Section of the National Institutes of Health has recommended to the Surgeon General of the Public Health Service that the use of oral saline solutions be adopted as standard procedure in the treatment of shock due to burns and other injuries in the event of large-scale civilian catastrophe.

The recommendation followed action taken at the January, 1950, meeting of the Surgery Study Section, when such treatment was approved in principle. Dr. Carl A. Moyer, a member of the Study Section, was designated at that time to prepare a memorandum suitable for submission to Dr. Norvin A. Kiefer, Director, Health Resources Division (now Health Resources Office), National Security Resources Board.

EDITOR'S NOTE: The above article calls attention to a simple adjunct in the treatment of shock due to burns and other injuries which has been found to be of value. It is, therefore, being published for the information of the profession of Minnesota.

Dr. Moyer's memorandum, which was submitted to Dr. Kiefer on February 15, 1950, reads as follows:

"Since the publication of the experimental work of Dr. Rosenthal, Dr. Joller, et al, orally administered salt solutions have been employed in the treatment of burns at the University of Michigan Hospital, Ann Arbor, Michigan; at the Wayne County General Hospital, Eloise, Michigan; and at Parkland Hospital, Dallas, Texas. Personal clinical experience, in the above-named hospitals, has convinced me that the orally administered salt solutions are valuable adjunctive agents in the treatment of shock incident to burns, fractures, peritonitis, and acute anaphylactoid reactions. Certain factors are important in governing the effectiveness of the oral administration of salt solutions. They are as follows:

"1. The composition of the salt solution: The most palatable salt solution is made by dissolving 3 to 4 grams of sodium chloride and 2 to 3 grams of sodium citrate in each liter of water. If sodium citrate is not available, ordinary baking soda may be substituted for it.

"2. The concentration of salt should not be in excess of 140 milliequivalents of sodium per liter. If the concentration is above this, vomiting and diarrhea become important complicating factors.

"3. Whenever profound peripheral circulatory collapse is present, the intravenous route of administration must be used until peripheral blood flow has been reestablished. The salt solutions that we have found most satisfactory for this purpose are Hartmann's solution (Lactate-Ringer's solution) or plasma. In addition to the salt solution or plasma intravenously, whole blood is given concurrently whenever peripheral circulatory collapse exists. This materially implements the effectiveness of salt solutions.

"The slightly hypotonic salt solution is the only drinking fluid permitted the injured individual until the edema of the injured parts begins to subside. Certain exceptions to this rule have to be made during the hot weather of summer when it is sometimes necessary to permit the partaking of some non-salty water.

"A much as 10 liters of the hypotonic salt solution have been drunk in the twenty-four-hour period by adults who have been severely burned. Since salt solution has been substituted for water, as a drinkable fluid, no burned person who has lived for longer than three hours after being admitted to the hospital has suffered from anuria. The 'early toxemia phase' of the burns has also failed to appear and the osmotic concentration of the plasma electrolytes has been well maintained.

"We feel that much more clinical observation and actual experimental work should be undertaken regarding the effectiveness of the basic principles of the supportive therapy of burns that have been so beautifully demonstrated by Dr. Rosenthal. It is obvious that the adoption of a more active program of investigation into the relative effectiveness of simple measures to combat shock would be of extreme importance to the Armed Forces and to the civilian population in the event of another war."

Because of the sharpened national emergency that developed during the summer of 1950, the Surgery Study Section, in approving Dr. Moyer's memorandum at its meeting on September 16, changed the last paragraph to read:

"While further clinical research concerning the effectiveness of oral salt solution in the treatment of burns and other injuries is certainly in order, there is already sufficient evidence to suggest that this form of treatment should be used in any large-scale disaster involving the civilian population."

The Surgery Study Section letter to the Surgeon General, dated September 16, 1950, reads as follows:

"It is my understanding that one of the functions of the Study Sections is to offer advice to the Surgeon General in fields of medicine lying within the special competence of the Study Section members. At the January, 1950, meeting of the Surgery Study Section, there was considerable discussion concerning the use of oral saline solutions in the treatment of burns and other serious injuries. It was the consensus of the Section at that time that, on the basis of the animal work which had been done by Dr. Rosenthal of the National Institutes of Health, and the clinical work which had been done by Dr. Carl A. Moyer, by the undersigned, and by others, the efficacy of such treatment had been definitely demonstrated and that, while there is need to stimulate additional research in this field, our present knowledge is sound enough so that action can be taken on this basis. Dr. Moyer was designated to draft a short memorandum expressing our point of view on this subject. Such a memorandum was prepared and furnished to Dr. Norvin C. Kiefer, Director, Health Resources Division, National Security Resources Board, on February 15, 1950. A copy of Dr. Moyer's memorandum is attached.

"In view of the more acute national emergency that has developed since Dr. Moyer wrote this memorandum, the Study Section, at its meeting on September 16, 1950, voted to recommend that the principles of treatment outlined in his memorandum be adopted for widespread use in any large-scale disaster involving the civilian population. Because of the present emergency situation, we have modified the last paragraph of Dr. Moyer's memorandum to read, 'While further clinical research concerning the effectiveness of oral salt solution in the treatment of burns and other injuries is certainly in order, there is already sufficient evidence to suggest that this form of treatment should be used in any large-scale disaster involving the civilian population.'

"You are at liberty to transmit this recommendation of the Surgery Study Section to the National Security Resources Board or to other proper agencies, and, if you see fit, to publish it. We feel strongly that it is important for the medical profession of the country and for those planning for the handling of potential disasters to be informed of the value of this simple and easily carried out form of treatment."

The letter was signed by Frederick A. Coller, M.D., University of Michigan, Chairman of the Surgery Study Section.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

NEWSPAPER COMPLAINS OF TOO MANY ZEROS

Using its familiar method of sly kidding with a serious undertone, the Wall Street *Journal* recently found that the "billion dollar era" makes it rather uncomfortable. The *Journal*, and probably most Americans, finds that figures of the national debt and federal spending are a little difficult to understand, and too many zeros can have ominous implications. The paper says:

> "Frankly, we've never felt at home in the billion dollar era. A dozen ciphers added onto a digit or combination of digits blurs our economic comprehension.
>
> "We can easily grasp five cents for a pack of chewing gum or one dollar for a haircut or even seventy-five dollars for a new suit. But 40,000,000,000 or 45,000,000,000 as a measurement of dollars brings on a sort of myopic miscomprehension that leaves us not quite sure what it means."

The Explanation—Simple?

The *Journal* had hopes of being able to count the costs of government after the second world war, but now has to try to see the figures of spending in a proportionate light—giving each second an amount to spend. The result is:

> "After a World War II spending spree that left endless zeros whirling wildly through our head, we hoped things might settle down where we could see and count the cost of government. But that hasn't happened and now the cost is on the rise again.
>
> "To try to bring the spending down to our size we've taken this fiscal year's prospective spending, some $40,000,000,000 to $45,000,000,000 and translated it into so much per second—through the year. That comes out to a minimum $1,720. What that means is that while we smoke one cigarette $228,000 disappears. And in the time it takes us to commute from home to office each morning $6,000,000 is gone."

There's a Moral

In the time it takes to smoke away $6,000,000, the average taxpayer stops to realize that his money is going altogether too swiftly. The more the government spends, the more it has to spend, and the more control it wields. The *Journal* wisely advises that tax money should be more carefully spent, and not squandered on schemes which are unnecessary to the citizens' good:

> "We know that wars are costly. But a lot of those dollars have nothing to do with war or defense. They go to subsidize housing and buy 'surplus' potatoes and dried eggs and a lot of things we could do without."

The moral to the whole story seems to be that if American voters choose the correct members of Congress, less lavish spending will begin to be evident in the Eighty-second Congress beginning in January.

INDUSTRIALISTS EXPLAIN DEMAND FOR PENSIONS

The key factor behind the demand for pensions was explained recently by a speaker before the National Association of Cost Accountants. Percival F. Brundage, of Price Waterhouse & Co., sounded the warning that, "Debasement of the dollar is a key factor behind the demand for pensions. This is so," he said, "because inflation discourages personal savings by reducing their value as time goes by."

Adding his note of warning that continued decreased value of the dollar will make savings for old age smaller in purchasing power, Robert C. Tyson, comptroller for United States Steel Corp., said:

> "Thus, if there is a continuing debasement of the money, with resulting price and wage inflation, then the dollar amounts to the pension based upon the level of wages of the last ten years of service will be greater than were provided for during the earlier years of service at lower levels of dollar wages. The dollars set aside during these earlier periods therefore may prove insufficient and have to be made up at higher costs than were previously calculated."

Mr. Tyson's remarks had been limited to private pension plans, but he then stated, "Government Social Security plans are similarly complicated, but the Government can always manipulate the currency."

Those falling under the new social security groups, will wonder if the government will use its power to manipulate the currency once again, thus exercising more control over more people than ever before in peace time. Mr. Tyson remarks:

> "Can you think of a handier and more popular device for power-hungry people to employ in obtaining support than promises to take good care of people when they get old—that is, later on? The 'later on' is very important to the promiser; he gets the popularity he seeks today. As for paying up tomorrow—well, tomorrow is another day, and if necessary the currency can be debased. It has been in other times and places. In this country it already has been debased by nearly one-half since social security was first promised to numerous voters."

AMA RISES AGAIN TO ANSWER EWING

Oscar R. Ewing, in his own *little* way, has again reverted to smear tactics in a new vicious attack on the American Medical association. By injecting the racial issue into his blows, Ewing belittled himself more than usual by accusing medical schools of practicing discrimination against Jews. The American Medical association replied with the following news release:

> "The American Medical association in a blistering indictment of Federal Security Administrator Oscar Ewing, which stated that he had twice been given a vote of 'no confidence' in Congress, today characterized him as a 'disappointed, embittered bureaucrat, who should be removed from office before he does further harm to the country.'
>
> "Dr. George F. Lull, Chicago, general manager of the A.M.A., who issued the statement, declared:
>
> 'Mr. Ewing, in his speech . . . before the American Jewish Congress, descended to the depths of political demagoguery when he falsely implied that the American Medical Association was practicing discrimination against Jews . . . The two Houses of Congress, in successive years, have given Mr. Ewing a decisive vote of no confidence, by rejecting his attempts to gain Cabinet stature and control over the medical profession through the creation of a Department of Health, Education and Security.
>
> 'President Truman should finish the job and dismiss Mr. Ewing from the public service before he does further harm to the country.'"

DOCTORS GET SMALL FRACTION OF COUNTRY'S MONEY

People who are inclined to think that American doctors make money hand over fist should realize that much of the doctor's time is given gratis and that *twice* as much is spent for other health services as for physicians' fees.

According to a government survey, made public recently, only about one-third of the money spent for health purposes goes to physicians in payment for their services.

Citing the figures in the Commerce department's "Survey of Current Business," The Bulletin of the Academy of Medicine of Cleveland says:

> "During the 12 months (1949) physicians received $2,267,000,000. During the same 12 months Americans were spending $1,391,000,000 on drugs, $105,000,000 on private nurses, $416,000,000 on ophthalmic products and orthopedic appliances and $1,631,000,000 on private hospitals. (Incidentally, if non-private hospitals were included—U. S., state and local—the hospital cost figure would be several times as high, with a subsequently greater difference between payments to physicians and payments for other health services.)
>
> "Several other comparisons are interesting. For instance, $395,000,000 went for such burial items as cemeteries, crematories, monuments and tombstones. This figure, according to the survey, just about equals the 'net amount' spent for accident and health insurance. It is almost four times as great as expenditures for private nurses, and it is found to total almost half the amount paid to dentists . . ."

AMERICAN DOCTOR STUDIES BRITISH HEALTH SERVICE

An American doctor, recently returned from Great Britain, made a comparison of medical care and costs under national health service in England, and medical care and costs under the American medical system.

While admitting that the American system of medicine, good though it is, has many faults, Dorothy V. Whipple, M.D., quoted in *The Survey*, remarks, "Frankly, as an American doctor, I was shocked at the quality of medical care given by the English urban general practitioners."

Reporting on differences between the British and American systems, Dr. Whipple says:

> "In the United States, distinctions between general practitioner and specialist are not sharp. Often a patient may not be quite sure whether or not his

doctor is a specialist." (This would never happen in England.)

Dr. Whipple also studied the fee system and how it works:

"The general practitioner receives a capitation fee —that is a flat sum per year for each name on his registry, regardless of how many times the doctor sees the patient. Specialists are paid salaries varying with their skill.

"To an American observer the disadvantages of the old British system seem more firmly established under the new scheme, which reinforces the wall between general practitioner and specialist."

More Patients, Poorer Care

With the advent of National Health Service, Dr. Whipple states, most doctors found they had more work to do. "Even though a doctor served exactly the same area and the same families as before, he had more calls as soon as no direct payment was required. Part of the increased load represented persons who had put off medical care because they could not pay the bill. Some of the increased load was foolishness—people who wanted what they could get because it was 'free.'"

The kind of medical care received is described by Dr. Whipple:

"But what of the care these people receive? The general practitioner's income depends not on the number he treats but the number registered with him. The law says he may not have more than 4,000 on his list. Obviously no doctor can give much care to each of 4,000 men, women and children, even if only half of them actually require his services in any one year.

Calls GP a "Clearing House"

"The more patients the general physician has, the greater is his tendency to refer cases to the hospital and the specialist. As a result, he becomes increasingly a clearing house, less and less a real practitioner of the healing art. He is so busy he has little time for preventive medical service. All too often he prescribes the customary bottle of sedative and allows the patient to go along to see whether anything serious develops."

DECREASE IN TUBERCULOSIS

In 1937, Wade H. Frost concluded that the point had been reached in the United States where there is a gradual downward trend in the incidence of tuberculosis, and that, barring major upsets in civilization, the eventual eradication of the disease can be expected. The continued decline in the annual number of deaths from tuberculosis during the past twelve years, in spite of the adverse conditions caused by a great war, is ground for confidence in the accuracy of Frost's conclusion. A. C. Christie, M.D., *Pub. Health Reports,* June 2, 1950.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Bldg.
Saint Paul 2, Minnesota
J. F. DuBois, M.D., Secretary

St. Paul Woman Sentenced to Jail Term for Criminal Abortion

Re State of Minnesota vs. Helen A. Heck.

On October 13, 1950, Helen A. Heck, forty-three years of age, 809 Iglehart Ave., Saint Paul, Minnesota, was sentenced by the Hon. Gustavus Loevinger, Judge of the District Court of Ramsey County, Minnesota, to a term of not to exceed eight years in the Women's Reformatory at Shakopee. The defendant Heck had previously entered a plea of guilty on September 19, 1950, to an information charging her with the crime of abortion and to having a prior conviction in 1947, also for the crime of abortion. Following a statement by the attorney for the defendant, and legal counsel for the Minnesota State Board of Medical Examiners, Judge Loevinger ordered the case continued to April 6, 1951, at 2:00 p.m., the defendant, however, to remain in the custody of the Sheriff of Ramsey County. This means that the defendant will have to serve the first six months of her sentence in the Ramsey County Jail and the Court will then determine whether or not the balance of the sentence should be stayed and the defendant placed on probation. Judge Loevinger cautioned the defendant that probation was hardly indicated by her past record. The Court also stated that the defendant "undertakes to practice medicine and surgery without having the necessary qualifications."

The defendant Heck, who has no medical training of any kind, was arrested by Saint Paul police officers on September 10 ,1950, following the admission of a twenty-two-year-old Minneapolis divorcee to Minneapolis General Hospital suffering from the after effects of a criminal abortion. The police also discovered another patient, a twenty-one-year-old unmarried Saint Paul girl, in the apartment of the defendant Heck upon whom the defendant had attempted an abortion. The investigation disclosed that the defendant received $265 for her services in the Minneapolis case, and $425 for her services in the Saint Paul case. Police also seized one speculum, 14 rubber catheters and numerous medicinal preparations in the apartment of the defendant. On September 18, 1950, a complaint was filed against the defendant in the Municipal Court of Saint Paul, charging the defendant with the crime of abortion in the Minneapolis case. On September 19, the defendant was arraigned in the Municipal Court, waived a preliminary examination, and was held to the District Court. On the same date, the defendant was arraigned in the District Court on an information charging her with the crime of abortion, and to that information she entered a plea of guilty. The Court then continued the matter to October 13, for sentence as outlined above.

The records in the office of the Clerk of the District Court of Ramsey County disclose that the defendant Heck has a prior conviction for the crime of abortion. On August 21, 1947, the defendant, together with one Assunda Willner entered a plea of guilty in the District Court of Ramsey County, to an information charging both with the crime of abortion. For that offense Judge Parks sentenced the defendant to a term of not to exceed four years in the Women's Reformatory at Shakopee but stayed the sentence after the defendant served sixty days in the Ramsey County Jail.

Minnesota Department of Health

METHEMOGLOBINEMIA IN INFANTS

During 1947, 1948, and 1949, 146 cases of methemoglobinemia in infants due to nitrates in well water were reported. This included fourteen deaths. For a period of ten months no cases were reported but during the past five months fourteen cases have been reported, with two deaths. As physicians became familiar with this condition during the study carried out by the Minnesota Department of Health, parents with newborn infants were warned to use only approved municipal water supplies or safe private water supplies. In recent months, however, physicians have apparently neglected to inform parents of the danger of using questionable well water in infant formulas, especially in southwestern Minnesota.

A brief résumé of the study of methemoglobinemia in infants due to nitrates in well water is given to remind physicians that this disease must be kept in mind. Ninety per cent of the infants were under two months of age and about 8 per cent were between two and five months old. The youngest infant was seven days old and the oldest was five months old. More than half of the infants developed symptoms in one to three weeks after being on a formula requiring considerable water as a diluent. Fifteen per cent developed symptoms in less than seven days, the shortest period being one day. No breast-fed infant developed cyanosis. Evaporated milk mixtures were responsible for 40 per cent of the cases, powdered milk formulas for 35 per cent and diluted cow's milk for 25 per cent. The characteristic symptom is a grayish blue or brownish blue cyanosis accompanied frequently by listlessness or lethargy, diarrhea, or fussiness. Most of the private water supplies involved were shallow dug or bored wells within 50 feet of a source of pollution and contained from 25 to 50 parts per million of nitrate nitrogen, the average being from 50 to 75 ppm.

A presumptive diagnosis may be made if on removal of venous blood for hemoglobin determination the blood is chocolate colored and if there are more than 10 to 20 parts per million of nitrate nitrogen in the water used in the formula. Such a diagnosis is justified if there is spontaneous disappearance of the cyanosis in 24 to 48 hours on changing the water in the formula to an approved water supply and the nitrate nitrogen content of the water used in the formula exceeds 10 to 20 parts per million. In either case the history and physical findings should be typical. An absolute diagnosis is made by demonstrating a definite methemoglobin live on spectroscopic examination or by the chemical analytic method of Evelyn and Malloy.

In the differential diagnosis certain serious conditions must be ruled out, including congenital heart disease, pneumonia, atelectasis, pneumothorax, diaphragmatic hernia, congenital pulmonary, and tracheal malformations, and "thymic syndrome." It is well to remember Ferrant's observation, that there is a striking difference between the cyanosis and the alarming condition of the infant on the one hand, and the normal pulse and respiration and lack of physical findings on the other.

In mild cases, treatment consists of changing the water used in the formula to an approved municipal supply. Many physicians use oxygen but there is considerable doubt as to its value in this condition. Ascorbic acid has been used successfully. In severe cases, one per cent methylene blue solution, one to two mg. per kg. intravenously, may be life saving.

It is requested that physicians notify the Minnesota Department of Health, University Campus, when such infants are seen, and that samples of well water be mailed to the department for nitrate analysis. A copy of the reprint of the article on methemoglobinemia which appeared in the August, 1950, issue of MINNESOTA MEDICINE is available on request.

BIRTH AND STILLBIRTH CERTIFICATES

Revised certificates of death, live birth, and stillbirth have been developed and were first used in Minnesota beginning January 1, 1950. A discussion of these new forms of vital records by Casady and Brower appeared in the December, 1949, issue of MINNESOTA MEDICINE. The importance of exactness in reporting was pointed out and emphasis was given to the necessity for accurate data on birth weight, prematurity, and congenital malformations. Since prematurity was the ninth leading cause of death and congenital malformations in tenth place in Minnesota in 1949 such information is needed in the development of programs related to the care and survival of premature infants as well of problems involved in congenital malformations.

A preliminary review of 20,000 birth certificates indicates that there is some confusion as to the definitions of live birth, stillbirth, and prematurity. The following definitions should clarify the situation. The international definition of a *live birth* is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which after such separation, breathes or shows any evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movements of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached.

Full term pregnancy varies from 220 to 330 days, with an average of 270 days. This is the equivalent of nine calendar months of thirty days each or approximately ten lunar months of twenty-eight days, computed on the basis of Naegele's rule, from the date of onset of the last menstrual period to delivery. A full-term pregnancy is, therefore, not thirty-six weeks but is actually forty weeks of gestation.

A *stillbirth* is a delivery of a fetus showing no evidence of life after complete birth (no action of heart, breathing, or movement of voluntary muscle), after

(Continued on Page 1165)

Minneapolis Surgical Society

Meeting of January 5, 1950

The President, Ernest R. Anderson, M.D., in the Chair

ACUTE CONDITIONS OF THE ABDOMEN

L. A. STELTER, M.D.
Minneapolis, Minnesota

The reason for the common pitfalls in the diagnosis of acute abdominal conditions is that we think of the multitude of possibilities rather than the few outstanding conditions which confront us in everyday surgery.

To elaborate on all the possible catastrophes of an abdomen only adds to confusion with wasted time and words. In order to make our job more practical and efficacious, let us have a definite plan of attack by combining our anatomic location of disease, clinical, and laboratory findings in such a way that the diagnosis may be reached more easily and then treat the patient accordingly.

First, for simplicity, let us divide the abdomen in two planes: the upper abdomen, that part lying in the plane above a line drawn transversely through the umbilicus, and the lower abdomen, that part lying beneath this same line.

Let us consider the most common conditions which may occur in these planes. Next we shall combine our history, present complaints (male or female), physical findings, laboratory and x-ray findings in such a way that a conclusion may be reached.

Those conditions occurring in the upper abdomen are:

1. *Acute Cholecystitis.*—It has been said that certain people develop certain diseases and this seems to hold here; the gall-bladder type are fair, fat, and forty, though occasionally a very thin patient under forty years of age may develop the most severe gall-bladder disease. The chief complaints of the patient are pain, food distress, food dyscrasia, belching, and bloating. The four foods most offensive are fried and fatty foods, raw apples, cucumbers, and cabbage. Thorek calls such people the 7 F's—female, fair, fat, forty, flatulent, flabby, and fertile.

The pain may be intense and constant or intermittent and colicky. Colicky pain indicates an obstructive lesion or the passage of a stone. The pain is located in the right upper quadrant and radiates along the costal nerves to the back and scapular region. Occasionally it may be referred along the splanchnic nerves which supply the stomach and must not be confused with ulcer or carcinoma of the stomach. Gall-bladder pain does not refer to the shoulder. Shoulder pain is due to phrenic nerve irritation and is due to a different mechanism.

The temperature, pulse and respiration are elevated. The temperature of the acute gall bladder rises to 101°-102° in the first twenty-four hours. The pulse increases at the rate of about 10 beats per degree of temperature. The respiration rate increases because of chest pain and painful breathing and may lead to confusion with early pleurisy or pneumonia. The gall-bladder area is tender to touch. The point most markedly tender is beneath the right costal margin. If the tenderness is lower or near the umbilicus, it is due to inflammation in a low lying gall bladder or a retrocecal appendicitis. Here Ligat's sign will be of help. Rectal and recto-vaginal and vaginal examinations are made always. Laboratory examinations consist of complete blood count and urinalysis. The differential count is most important as a high polymorphonuclear count indicates an infectious process, and a low polymorphonuclear count in the presence of a low total white blood cell count means poor resistance and a bad prognosis. A few blood cells in the urine may be misleading and a negative urine erroneous. A scout x-ray film of every acute abdomen is taken in the upright and flat position as much information is obtained in this manner.

2. *Perforated Peptic Ulcer.*—This is rare in the female. The perforation may be the first symptom, but usually there is a history of peptic ulcer, gastric hemorrhage or food distress. The pain is severe and sudden and so intense that the patient doubles up and may drop to the floor. The pain causes the abdomen to become board-like rigid and the patient shows signs of shock. About one-fourth of the patients have shoulder pain due to phrenic nerve irritation. The abdomen is tense and tender, and point tenderness early will be above the umbilicus. Later it will be in the right lower abdominal quadrant. Appendicitis is frequently mistaken for ruptured peptic ulcer. Auscultation reveals a silent abdomen. The temperature is normal or subnormal at first. With peritonitis it rises. The pulse increases moderately and the respirations are 24 to 30 per minute, shallow and costal in character. The leukocyte count averages 15,000, and polymorphonuclear cells average 80 per cent. Leukopenia may be present. The urine is normal.

In 1908 Weinberger observed on x-ray film the accumulation of gas under the diaphragm, and Popper in 1915 reported a case in which he observed gas under the diaphragm by fluoroscopy. In about 70 per cent of the cases air can be demonstrated under the right diaphragm by fluoroscopy with the patient lying on the left side.

3. *Acute Pancreatitis.*—There are two types—acute hemorrhagic and acute edematous pancreatitis. The latter is the more mild and recovery usually occurs without therapy, while the former is associated with hemorrhage in the pancreas and fat necrosis, and prompt treatment is necessary. The history is usually similar to that of acute cholecystitis and it occurs more frequently in females of the stout type over forty years of age. It appears following the ingestion of a heavy meal. The onset of pain is dramatic, sudden, excruciating, and radiating to one or both loins. The pain is relieved when the patient sits up or lies on his abdomen. Reflex vomiting and retching occurs. Examination shows the patient to be in extreme pain, in semi-shock, with subnormal temperature, rapid, thready pulse, epigastric tenderness associated with muscular defense localized to the organ, most marked between the xiphoid and umbilicus; occasionally ecchymosis in one or both loins or at times around the navel due to extravasation of blood around the retroperitoneal space. Abdominal auscultation, a helpful diagnostic agent, usually reveals a quiet but not silent abdomen. Gage blocks the upper lumbar region with procaine and gets immediate relief for his patients and considers the procedure of positive diagnostic help. Laboratory work shows an elevated leukocyte count and glycosuria. A blood sugar above 300 milligrams per cent may be indicative of a fatal outcome. Elevated blood amylase is a positive test and becomes present in two to three hours after the onset of the attack. X-ray studies are not very helpful but separation of the upper and lower limb of the duodenum represents thickening of the pancreas.

4. *Ruptured Viscus (Liver or Spleen).*—If there is a history of accident or trauma, the patient may or may not present signs of shock and shoulder pain, either right or left, due to phrenic nerve irritation. Signs of internal hemorrhage are present and a diagnostic puncture of the abdomen is an important aid in deciding on urgent surgical interference. Liver dullness or splenic dullness is increased and x-ray will give evidence of an enlarged organ with displacement. The patient must be watched for late secondary hemorrhage. Laboratory findings suggest peritoneal irritation with leukocytosis and lowered hemoglobin values due to hemorrhage. Urinalysis will be negative.

5. *Coronary Disease.*—The surgeon cannot afford to make the fatal error of confusing an acute coronary disease with an acute abdominal condition. The coronary condition is more common in men past the age of forty, with a history of previous dyspnea and chest pain occurring during exertion. The pain may be sudden or gradual, increasing in severity, involving the upper abdomen and chest and radiating to the left arm or both arms or up the neck. There is fear and fright associated with the pain. There is a history of indigestion, belching, and bloating not related to foods. The attack may appear after a heavy meal.

Examination reveals possibly an enlarged heart, a soft slow pulse, low blood pressure, dilated neck veins, a flaccid abdomen and no point tenderness or muscle spasm. An elevated leukocyte count and sedimentation rate and a positive electrocardiogram reading are diagnostic, and these findings may be present the first twenty-four to forty-eight hours after the onset of the attack. X-ray reveals a negative abdomen and an enlarged heart. Urinalysis will be negative.

Common pathologic conditions occurring in the lower abdomen are:

1. *Acute appendicitis* is found more frequently in individuals under forty years of age and is somewhat more common in females. The patient usually first notices a "stomach-ache" and the druggist or good friend has prescribed a cathartic. If given the Two Question Test—(1) "Where was your pain when it started?" and (2) "Where does it hurt you now?"—the patient usually points to the epigastrium in answer to the first question and to the right lower quadrant in answer to the second question. This simple method will frequently diagnose the case.

Text books that teach that acute appendicitis can be diagnosed by pain, temperature, nausea, vomiting, and leukocytosis may be erroneous. Nausea and vomiting are the exception, not the rule, in appendicitis. Loss of appetite is a more constant sign and is due to early distention of the appendix. Wyatt states that a child with abdominal pain who can eat does not have appendicitis. Diarrhea and chills are rare in acute appendicitis and constipation is the rule. Fever is not an early finding but is present after peritoneal irritation has taken place. When the temperature has risen to 101° or 103°, localized or beginning generalized peritonitis has started already. Point tenderness is the most important sign in the diagnosis. With the patient lying on his back, pressure in the region of the inflamed organ will cause the patient to wince with pain and cause muscle spasm (both recti) due to a defense mechanism. Ligat's sign will be helpful and Rovsings' sign may be elicited by pressure on the left lower quadrant which forces gas along the colon against the cecum, causing pain over the cecum. It is found in 60 to 70 per cent of the cases. Rectal and vaginal examinations are important. Laboratory examination reveals a leukocyte count of 14,000 to 15,000 with a high polymorphonuclear cell count. However, occasionally, a gangrenous appendix will be associated with a normal count. Urinalysis may show occasional pus cells due to ureteral irritation. Flat plate of the abdomen helps in ruling out other abdominal conditions.

2. *Renal Colic.*—This may be due to stones, blood clots, urates or ureteral kink. The condition is most frequent in males and there may be a history of previous attacks, family tendencies, a story of gout or parathyroid pathology. The pain is sudden, severe and colicky, starting in the lumbar region, right or left, and radiating to the vulva or testicle. There is restlessness and thrashing about while the patient with peritonitis lies quiet. Vomiting and urinary frequency are common. During urination the colicky pain may be altered.

Physical examination rarely reveals an elevated tem-

perature. Bradycardia is a common finding. A clean tongue and slow pulse in an acute abdomen is a renal condition until proven otherwise. Murphy percussion and tap is very painful.

Leukocytosis may be present. Blood, pus, and albumin are found in the urine. However, a stone may block completely a ureter and produce a negative urine. X-ray examination may reveal a stone present though non-opaque substances may cause the renal colic.

3. *Gynecologic Disorders.*—In considering other conditions of the lower abdomen, the general surgeon must be bold enough to invade the field of the gynecologist. Here such conditions as acute salpingitis, twisted ovarian pedicle and ruptured ectopic pregnancy are most frequent. The diagnoses are made by the same plan of attack.

4. *Diverticulitis.*—There is a history of irregularity of bowel habits and at times colicky intestinal cramps and pain in the lower abdomen. The condition is more common in males. Course and rough foods cause intestinal irritation. During an attack there is leukocytosis, moderate fever, distention of the abdomen and bloating. X-ray examination with a small amount of barium will prove the diagnosis.

Case 1.—Mrs. E. M., a white woman, aged sixty-six, had a history of repeated attacks of right kidney infection for fifteen years. At one time she passed a kidney stone. Present illness started two days previous to hospital admission with pain in the right kidney region and frequency and burning of urination. There was no history of any food distress but there was nausea. Temperature was 102°, pulse 80 on admission.

Examination revealed a somewhat distended though flaccid abdomen. There was no point tenderness except the tenderness over the right kidney on Murphy percussion. There was some tenderness on deep palpation over a lower right rectus scar. Vaginal examination was negative.

The urinalysis showed two plus albumin, 40 to 50 pus cells, and 5 to 10 red cells. The white blood cell count was 19,800, 85 per cent polymorphonuclear cells, 15 per cent lymphocytes. X-ray revealed definite distention of the large and small bowel. The kidney shadows were normal but some calcifications in the right pelvis which might be phleboliths. The impression was acute pyelitis, possibly kidney stone passing. On the third day in the hospital the patient became very distended and complained of severe pain in the right costal region with point tenderness. Exploratory laporotomy revealed a perforated gall bladder full of stones, free bile in the peritoneal cavity. Drainage was instituted. The patient ran a stormy course. She developed pneumonia with empyema. Death ensued. The autopsy revealed localized peritonitis, sub-diaphragmatic abscess, empyema, and pyelitis.

Case 2.—Mr. M. S., a white man, aged sixty-three, had a negative past history as to stomach distress or indigestion. The present illness started shortly after arising in the morning with an acute upper abdominal pain. This was his first attack of stomach trouble. He vomited several times. Examination revealed a board-like, rigid upper abdomen. There was localized tenderness above the navel line. Negative urinalysis. There were elevated white cell and polymorphonuclear cell counts. X-ray findings and fluoroscopy of the abdomen revealed a small amount of air under the right diaphragm. Laporotomy verified the diagnosis of a perforated duodenal ulcer. The post-operative course was uneventful.

Case 3.—Mr. N. H., a white man, aged forty-nine, was seen in consultation the second day after his admission to the hospital. He had a distended abdomen. There was moderate tenderness in the left pelvic region. Rectal examination revealed a mass in the left pelvic region. The urinalysis was negative. The white cell count was 15,900, with 80 per cent polymorphonuclear cells. The x-ray revealed loops of distended bowel with gas in the colon and lower bowel. Conservative treatment was continued. Twenty-four hours later the patient became worse and exploratory laparotomy revealed a ruptured appendix with ileum obstructed due to an abscess and exudate in the pelvis. Appendectomy was done, leaving an indwelling ileostomy tube. The post-operative course was stormy, but the patient recovered.

Case 4.—Master W. M., a white boy, aged six, was struck by an automobile and received a concussion, bruises to the lower right chest and upper abdomen. He entered the hospital semi-comatose Examination revealed multiple abrasions on the boy's head and lower chest. The urinalysis was negative. Hemoglobin was 74 per cent. The white cell count was 14,000, with 78 per cent polymorphonuclear cells. X-ray of the abdomen on admission showed nothing of note. When seen in consultation two days later the lower right chest revealed dullness. There was increased liver dullness. The hemoglobin was 66 per cent. The red cell count was 3,100,000 and the white count was 15,600. X-ray showed the liver to be increased in size. A needle was introduced in the abdomen and revealed no intraperitoneal blood. The boy was transfused and treated conservatively and recovery was uneventful. A diagnosis of intracapsular hemorrhage of the liver was made.

Case 5.—Mr. A. S., a white man, aged fifty, had been under my observation for several years with a duodenal ulcer which had been inactive for the past fifteen months. Present illness of stomach distress had appeared five days prior to hospital admission while on a hunting trip. Four hours before entering the hospital he developed severe abdominal pain around the navel with nausea and vomiting. His wife said he nearly fainted because the pain was so severe.

Examination revealed a board-like abdomen above the navel and along the right side with point tenderness in the right lower quadrant. The urinalysis was negative. The white cell count was 16,500, with 80 per cent polymorphonuclear cells. Flat plate of the abdomen was negative for air. A diagnosis of ruptured appendicitis was made and a lower right rectus incision revealed a retrocecal ruptured appendix. Appendectomy without drainage was performed. The postoperative course was uneventful.

Case 6.—Mrs. O. S., a white woman, aged thirty-seven, had been bleeding for two weeks prior to hospital admission. When seen by myself she gave a history of no missed periods or irregularity until the present bleeding episode. She had had two children living and well, the youngest being fifteen years of age. Examination revealed the patient in severe pelvic pain. The pulse was soft and rapid. Blood pressure was 100/80. There was marked tenderness in the right lower quadrant. Pelvic examination revealed a retroverted uterus and a tender, boggy mass in the right cul-de-sac. The patient refused needle puncture. The white cell count was 22,500, with 86 per cent polymorphonuclear cells. A flat plate of the abdomen gave no information. A laporotomy verified the diagnosis of a ruptured ectopic pregnancy. The postoperative course was uneventful.

Case 7.—Mrs. K. A., a white woman, aged fifty, had been admitted thirty-six hours prior to the time I saw

her in consultation. She gave the history of intermittent cramps of the lower abdomen associated with the appearance of menstrual blood. She had been operated upon twice in the past for appendicitis in childhood and had had a pelvic laporotomy eight years previously. Nasal suction had been started on her admission to the hospital, which gave her a small amount of relief until 6:00 a.m. of the day I examined her. When seen at 10:00 a.m., her pulse was 140 and blood pressure was 80/50. The skin was cold and clammy. The abdomen was moderately distended and there was a tender palpable mass in the left lower quadrant the size of a child's head. There was a right rectus and midline scar. Pelvic examination revealed a bloody discharge and a tense, tender palpable mass filling the left pelvis. A catheterized specimen of urine was normal. The white cell count was 18,600, with 88 per cent polymorphonuclear cells. A flat plate of the abdomen revealed a mass in the left lower abdomen and two large stones in the bladder. A diagnosis of twisted ovarian pedicle with gangrene or gangrenous bowel from an obstruction or mesenteric thrombosis was made. The patient's condition was critical and in spite of multiple portals of blood and fluid she remained in shock. Emergency exploratory under spinal anesthesia revealed multiple pelvic adhesions. Three loops of gangrenous small bowel, 72 cm. in length, held in the pelvis by an adhesive band to an ovarian cyst were liberated, resected, and an end-to-end open anastomosis was performed. As soon as the grangrenous bowel was excised the patient's condition improved. Her pulse lowered to 110 and a gradual rise in her blood pressure changed the entire picture. The abdominal tissue, which had been cold, began to warm. She left the operating room in fair condition and her postoperative course was uneventful.

Summary

1. Pitfalls in acute abdominal diagnosis are made when we confuse the more common disorders with the many possible abdominal catastrophies.

2. I have tried to simplify diagnostic procedures by a planned method:

(a) Dividing the abdomen in two planes.

(b) Correlating the clinical and laboratory findings

3. A case report has been given to represent each of the more common acute abdominal conditions.

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Discussion

DR. HAMLIN MATTSON: Development of chemotherapy and antibiotics has permitted more deliberation in cases where the diagnosis is obscure in acute abdominal conditions. In some instances nonoperative treatment is possible where before operation was considered imperative.

An example in point is perforated duodenal ulcer. When sulfonamides only were available, slow leaks on an empty stomach were treated occasionally with suction siphonage and chemotherapy.

In February, 1939, I saw a woman, aged forty-five, who had a fairly typical history and findings of ruptured duodenal ulcer with gas demonstrable under the right diaphragm. The rupture occurred about four hours after a meal, the area of peritoneal irritation was limited and with some temerity I treated her nonoperative as indicated above.

Infections have accounted for most of the fatalities in ruptured peptic ulcer. In 1937, Bergh, Bowers, and Wangensteen made one centimeter long incisions in the stomachs of animals. Those incised when the stomach contained food showed an 86 per cent mortality. Of those incised with empty stomachs only 6.8 per cent died. The mortality rate from perforated peptic ulcer has declined rapidly in the past years. Trieger in 1947 reported a 33 per cent mortality in 73 cases from 1930 to 1944 and no deaths in seventeen cases from 1944 to 1946. Others have reported similar results.

In 1946, Taylor of London reported trial of nonoperative treatment. In twenty-eight cases there was a 14.3 per cent mortality. Seeley in 1949 reported thirty-four cases with no mortality.

About a year ago, Bingham set forth the following criteria for non-operative treatment of ruptures:

1. Less than eight hours old, or more than three days
2. More than one hour since last meal.
3. Duodenal rather than gastric.
4. Small perforation.
5. Where the differential diagnosis is uncertain.

PROBLEMS IN ACUTE INTESTINAL OBSTRUCTION

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In discussing acute intestinal obstruction there are several physiological considerations that should be taken up. The first of these is fluid and electrolyte loss. When the obstruction is high and vomiting is profuse this loss may be enormous. A patient may lose up to 8,000 c.c. daily with a corresponding loss of sodium and chlorides. When obstruction is at the pylorus, profuse vomiting may throw a patient into alkalosis and even into gastric tetany. Fluid replacement containing as high as 20 to 30 grams of salt may be necessary to replace the loss of electrolytes. The response in these cases is dramatic.

The farther down the intestinal tract that the obstruction is located, the less one need worry about electrolyte loss. Then one must consider primarily the effects of distention. In an obstructed bowel the first thing that occurs is the accumulation of large amounts of gas. This gives the characteristic x-ray of small bowel obstruction. Later the accumulation of fluid in the distended loops may replace the gas almost entirely

and often gives a confusing x-ray picture unless one gets an upright film which will show fluid levels in the small bowel loops.

Distention is the most lethal factor in simple (non-strangulating) obstruction. If prolonged, it can initiate mucosal degeneration as shown by hemorrhage, erosion and ulceration. Marked distention can so compromise intramural blood flow as to endanger viability of the bowel. While the exact mechanism is not known, distention is thought to have much to do with the absorption of toxins from the obstructed bowel, for the relief of distention improves the general condition of the patient markedly.

The third most important physiological consideration is the effect of interference with the blood supply of a loop of bowel producing a strangulation obstruction. It is this factor that makes hazardous the non-operative or conservative treatment of mechanical obstruction by means of gastrointestinal tubes. It is often difficult to recognize strangulation obstruction even when the patient is being carefully watched and the surgeon is on the lookout for it. Interference with the blood supply to a loop of bowel is soon followed by loss of viability of the mucosa with resulting invasion of bacteria into the intestinal wall and through the serosa into the peritoneal cavity. Later frank necrosis and perforation may occur with gross peritoneal contamination.

In strangulation obstruction there is often enough blood loss into the lumen of the bowel and into the peritoneal cavity to account for some of the shock associated with intestinal obstruction.

While it is difficult to lay down any general rules of treatment because of the many varied causes of obstruction, it is pretty well agreed that acute obstructions of the small bowel requiring resection should be treated by immediate end-to-end anastomosis whereas acute obstruction of the large bowel should be best treated by colostomy—transverse colostomy if possible. An exception to this is acute obstruction of the right side of the colon which also can be treated safely by immediate resection and end-to-end ileo-colostomy.

Causes of Intestinal Obstruction

(In order of frequency)

A. Small Bowel
1. Adhesive bands
2. External hernia
3. Intussusception
4. Obturator
   a. Gallstones
   b. Foreign body
   c. Worms
5. Vascular
   a. Thrombosis
   b. Embolus
6. Congenital atresia
7. Volvulus
8. Neoplasm
9. Internal hernia

B. Large Bowel
1. Neoplasm
2. Volvulus
3. Diverticulitis
4. Adhesive bands

The manifestations of acute intestinal obstruction are so varied and complex that I felt that the subject could be best covered by concrete examples of cases illustrating diagnostic and therapeutic problems.

Case 1.—A man, aged seventy, early on the morning of August 13, 1949, experienced a pain and swelling in the right groin. He vomited and had what he described as a gas pain.

In mid-afternoon a strangulated right inguinal hernia was reduced by his physician. The pain persisting, he was sent to the hospital.

Late in the afternoon when he was seen in consultation, there was no swelling and no pain. Operation was not advised.

Three days later the patient was discharged from the hospital, a flat plate of the abdomen having been negative and the leukocyte count being normal.

This patient had a strangulated hernia with symptoms of bowel obstruction for a period of eight to ten hours. He had gas pains, vomiting, local tenderness and swelling. The patient was much opposed to an operation, and in view of the fact that he had reached the age of seventy before the hernia had caused him any symptoms, and because at the time I examined him, about one hour after the hernia had been reduced, he was completely free of symptoms, I agreed to forego an operation and instead we elected to observe him.

We kept him in the hospital and ran daily leukocyte counts for four days. These were normal. On the third day we had a flat plate of the abdomen which was entirely negative so the patient was discharged. If confronted with the same problem, I believe that one should strongly urge an operation. The uncertainties regarding the viability of the strangulated loop are too much to risk even when the patient is watched carefully. When contrasted with the next patient, this case takes on a more special interest.

Case 2.—A woman, aged sixty-six, a poor cardiac risk, had been operated upon by another surgeon on October 10, 1948, for a strangulated femoral hernia. A loop of bowel of questionable viability had been left.

A leukocytosis of 20,900, 20,850, and 18,700 persisting on October 12, 13 and 14, and a flat plate taken October 14 showing the small bowel distended with gas, the patient was reoperated upon. A necrotic loop of small bowel was resected and an end-to-end anastomosis made.

The patient died suddenly of a heart attack while out of bed on the fourth day following the second operation. An autopsy showed the anastomosis patent and the peritoneum clean.

Here again we are confronted with the problem of determining the viability of a loop of bowel inside the abdomen. The patient was an extremely bad heart risk who had been treated many times for cardiac decompensation by the surgeon who operated upon her for the strangulated femoral hernia. At the time of operation, after observing the bowel for some time, he felt that it would be viable and dropped it back. He was, however, worried about its status and asked me to follow her progress with him.

In such a situation you usually have a few days before an inviable bowel will rupture. Daily leukocyte and differential counts were taken. As shown in the case report these remained consistently high, around 20,000. Clinically there was some distention and tenderness, although the patient was quite obese and examination was unsatisfactory. A flat plate of the abdomen on the fourth day showed small bowel distention. In view of these findings, the patient was reoperated upon on the fourth day. The loop of bowel

was found to be necrotic—so soft that we feared it would rupture as we removed it.

A closed type of end-to-end anastomosis was carried out. The patient was out of bed. Suddenly, on the fourth day after her second operation she had a heart attack and expired.

The lesson to learn from these two cases is that if you drop back a loop of questionable viability, order daily leukocyte counts and get frequent flat plates of the abdomen. If the white counts remain persistently high for a few days, and if you can rule out any other complication which might raise the leukocyte count, you had better open up the patient and look again.

In addition to the usual signs of determining bowel vialibility at the time of operation, such as the return of color, arterial pulsations and active peristalsis, there are a few other aids that have proven helpful. Fluorescein solution given intravenously will show up as a green fluorescence in a viable bowel observed under ultraviolet light. Laufman and Method measured the surface temperature of the bowel and found that the temperature of a strangulated bowel was subnormal. When the strangulated mechanism was released, if the bowel was viable, the temperature would return to normal or above. If, however, the bowel was inviable, the temperature would remain subnormal. They also found that papaverine given at the time was helpful in overcoming venospasm and aided in the recovery of the bowel if it could survive. Arnold Kremen has called attention to the fact that the return of peristalsis is not always a reliable guide, for it may be simulated by active muscle contractions due to anoxemia.

Case 3.—A man, aged sixty-two, who was diabetic, was admitted to the hospital on January 16, 1949, six days following strangulation of an umbilical hernia.

The patient was very obese and distended on admission. A large umbilical hernia was red and phlegmonous and suggested a strangulated and necrotic bowel.

The same day the hernia was removed in toto without entering the sac. An aseptic end-to-end anastomosis of the distended and collapsed loops as they entered and left the hernia sac was made (method of Dennis and Varco).

Recovery was uneventful.

This patient lost a leg in a railroad accident and had been retired for years, during which time he had become extremely fat. He had an umbilical hernia for a long time which had given him no trouble. Six days prior to admission to the hospital this could no longer be reduced and his bowels stopped moving. The swelling slowly became red and tender. Examination showed a large umbilical hernia the size of a grapefruit that was red, edematous and septic from the enclosed gangrenous bowel. The rest of the abdomen was distended but soft. X-ray showed distended loops of bowel. We knew that if we once opened into this septic sac our patient would probably die of peritonitis. So using the method described by Dennis and Varco for strangulated femoral hernia, we encircled the hernia with our incision, excised the hernia in toto, resected the bowel as it entered and left the sac, removing the hernia with its encircling ring without any contamination whatsoever. An end-to-end anastomosis was carried out. To take pressure off the suture line we asked Dr. Wild to pass an intestinal tube following the operation. The postoperative convalescence was normal.

Case 4.—A woman, aged twenty-seven, had a normal delivery on September 28, 1945. Vague abdominal pains began on October 4, 1945, and occasionally emesis occurred. Temperature and pulse were normal.

On October 10, 1945, the patient suddenly went into shock. She was seen in consultation that day and appeared in moderate shock, with the abdomen rigid and distended. X-ray of the abdomen showed small bowel distention. The leukocyte count was 17,000, with 92 per cent polymorphonuclear cells.

The same day the abdomen was opened, and a strangulated loop of gangrenous small bowel, 129 cm. in length, was found caught under a band of adhesions. Resection was performed and an aseptic end-to-end anastomosis made.

This case illustrates the difficulty in diagnosing intestinal obstruction that develops during the postpartum period. During that time both the physician and the patient expect that she will have a certain amount of abdominal pain. This patient's postpartum period was normal up to the sixth day. She then began having crampy abdominal pains that persisted for four days, never severe until during the night of the tenth postpartum day. Then suddenly she went into shock. When I was asked to see her, the abdomen was rigid and distended, pulse was rapid and blood pressure low.

As soon as shock was corrected she was operated upon. A loop of bowel, 60 inches long, was found under a band. This was black and inviable. A closed type of end-to-end resection was done about 3 inches from the ileocecal valve. Postoperative convalescence was uneventful except for loose stools that persisted for about two months.

Case 5.—A woman, aged forty-six, was found to have a carcinoma of the transverse colon in the course of an operation on December 23, 1948, for supposed appendicitis. I was asked to assist and found a greatly distended cecum due to the obstructing carcinoma.

The carcinoma and proximal transverse colon and cecum were removed, and an aseptic end-to-end anastomosis between the ileum and distal transverse colon was made.

The patient was discharged on January 10, 1949, in good condition.

Complete obstructions of the right colon present a most acute emergency and require immediate surgical relief. The cecum is thin-walled and with the ileocecal valve usually remaining competent; it then becomes a closed obstruction comparable to a strangulated loop, and blowouts occur early and frequently.

Ordinarily it is generally agreed that definitive surgery should not be carried out in acute obstructing lesions of the large bowel. Acute obstructions of the right colon, however, are an exception to this rule. Here it is possible to remove all the obstructed portion of the colon together with the growth and make our anastomosis between normal collapsed distal colon and the terminal ileum. This can be done even if the small bowel is distended, for we know that there is usually no difficulty encountered suturing into the wall of

obstructed small bowel. Removal of the tense cecum may be facilitated and distention of the terminal ileum may be relieved by using the aseptic suction enterostomy of Wangensteen, inserting it after the abdomen has been opened through the wall of the terminal ileum down through the ileocecal valve into the cecum. If one has already passed a gastrointestinal tube into the lower ileum this may be passed through the ileocecal valve into the cecum and thus decompress it.

Case 6.—A man, aged sixty-seven, experienced colicky lower abdominal pain at hourly intervals beginning August 13, 1945. On the following day there was marked abdominal distention with rigidity. A flat x-ray plate of the abdomen showed a coffee-bean distention of the sigmoid.

At operation on August 14 a volvulus of the sigmoid colon at the peritoneal reflection was resected and a primary end-to-end anastomosis made.

The patient was discharged on October 5, 1945.

This patient whom I operated upon at General Hospital is interesting for several reasons. His gas pains were characteristic of colon obstruction. His colics, instead of coming every five to ten minutes as they usually occur in small bowel obstruction, came hourly. His flat plate was beautifully characteristic of volvulus and his local findings of tenderness and marked rigidity and distention gave one no choice as to proceedure. At operation the volvulus was completely black and gangrenous and extended from the pelvic floor to the left rib margin. The twist was located at the peritoneal reflection and was too low to allow exteriorization so an end-to-end anastomosis was carried out. This patient's plasma proteins were very low and he completely eviscerated on the eighth day. He was taken back to the operating room and the abdominal wall was resutured. His subsequent convalescence was normal.

A couple of years ago Dr. Brunsgaard of Norway spent some time at the University and interested those who heard him speak before this society in his method of reducing volvulus by means of a proctoscope with the insertion of a soft rubber tube into the volvulus. He reported 136 successful treatments with four deaths. He cautioned that one must not try the method where there is any indication or question of impaired circulation or gangrene. While exteriorization by Michulitz procedure has usually been recommended as the operative procedure of choice in volvulus, he contends that the twist is usually too low to permit this type of operation, as was true in our case, and he recommends the inversion and burying of the distal stump and the making of a colostomy of the proximal end with re-anastomosis later.

In every obstruction of the colon, volvulus must be considered. It causes about 16 per cent of colon obstructions and, unless relieved, gangrene with perforation will usually result. It can easily be overlooked if one makes a transverse colostomy to relieve sigmoid obstruction and assumes that the obstruction there is due to carcinoma. A flat plate usually gives a characteristic picture, as does also a barium enema.

Dr. Baronofsky has been interested in this problem at the University of Minnesota. His feeling is that if there is evidence of gangrene that it is not safe to reduce by tube and proctoscope and that one should do an immediate resection and end-to-end anastomosis. If there is no evidence of gangrene, he feels that the volvulus should be reduced by Brunsgaard's method, and after several days, one should resect and do an end-to-end anastomosis.

These last five cases where bowel resection was carried out in the face of acute obstruction due to varied causes recommend strongly the closed type of anastomosis.

Throughout the country there is still considerable argument between the proponents of the open and the closed types of bowel resection. Personally I have used the closed method of resection in practically every case of bowel resection that I have done during the last ten years, and I am convinced that anyone who gets accustomed to using it will not abandon it for the open type of resection.

While the antibiotics have given the open type of resection a greater degree of safety, one should not rely on them completely for protection. I recently operated for a ruptured appendix. In spite of massive doses of penicillin, streptomycin and intravenous aureomycin, the patient developed three intra-abdominal abscesses that had to be drained. Moreover, experimental work has shown that there is firmer healing where there is no serosal contamination at the time of operation. Also, contamination of the peritoneal cavity, while it may not be serious in the unobstructed case, may attain real magnitude in the acutely obstructed patient, for that patient does not tolerate soiling of any degree. Moreover, when it is necessary to anastomose loops of bowel of different sizes, as is necessary in doing an end-to-end anastomosis between a large distended loop of small bowel to a small collapsed bowel, or when one unites small bowel to colon end-to-end, this can be done very easily when one does it over clamps. By varying the angle that the clamp is placed on the two loops of bowel, one can easily make the opening the same size in the ends to be joined together.

The arguments of those who advocate the open anastomosis hold true for the most part only in those cases where one has the time and opportunity to preoperatively sterilize the bowel content. In the five cases which we have just presented we had no chance to prepare the bowel. In all of these, done in the face of acute obstruction where haste was essential, the closed type of resection stood us in good stead. To me, they represent situations where the closed type resection attains its greatest value and gives your patient a protection from infection that you cannot give him in any other way.

Since Dennis published his artcile in 1943, I have used his method in bowel resection almost routinely and I like it very much. Using it, no end-to-end anastomosis has failed to open on scheduled time, and except for the patient cited here who died of a heart attack four days after operation, I have had no deaths. His method differs from others in that it requires a 45° rotation of each end of the bowel in opposite directions so that the mesentery of the distended loop will be on the opposite side to that of the collapsed loop. This means that in an end-to-end anastomosis instead of ending up

with a junction with a 90° angle as is customary, one ends up with a straight tube.

Case 7.—A woman, aged thirty-nine, for two weeks ran a septic course with right abdominal pain and developed a mass in the right side of the abdomen.

On October 19, 1948, she was admitted to the hospital. The pain, mass and septic temperature persisted. Sulfasuxidine was started. A flat x-ray plate showed a mass on the right side and a dilated small bowel.

A barium enema on October 20 showed a narrowed terminal ileum. A flat plate on October 22 showed increasing small bowel distention.

At operation on October 22 a regional ileitis was found, with an abscess between the ileum and cecum. This was resected. An end-to-end anastomosis was made between the ileum and the transverse colon.

The postoperative temperature never went over 99.2° and the patient was discharged on January 30, 1948.

We present this case because it allowed us to accomplish something which was unique in our experience. At the time of operation we found dilated loops of small bowel terminating in a mass between the last foot of small bowel and the ascending colon. There, protected by the agglutinated bowels anteriorly and laterally and sealed by the parietal peritoneum posteriorly, was an abscess. Starting along the lateral wall of the ascending colon and getting into a line of cleavage behind the visceral peritoneum, we were able to remove the terminal ileum, cecum, ascending and right part of transverse colon which enclosed the abscess without rupture. An end-to-end anastomosis was carried out. Her temperature subsequent to operation never going over 99.2° is indicative of her uneventful convalescence. It is only on the rarest occasions that the anatomy makes it possible to remove an intra-abdominal abscess intact.

The results of surgical treatment of regional enteritis are notably poor. There is much argument whether one should do only a short circuiting operation or a radical resection of the diseased tissue. Operation should be postponed until the late stages of the disease and should be used primarily in the treatment of complications—obstruction, abscess, hemorrhage, fistulas, et cetera.

Case 8.—A woman, aged seventy-six, had a sudden onset of colicky abdominal pains with vomiting on November 24, 1947.

The colicky pains persisted the next day without flatus being expelled.

A flat x-ray plate of the abdomen taken November 26 showed a distended small bowel.

On November 28 a flat plate showed gas in the biliary tract.

On November 30 a flat plate showed the gas in the small bowel practically gone but much in the colon. On that day a gallstone 1.5 inches in diameter was extracted from the rectum.

An x-ray on December 1 showed that barium, taken orally, appeared in the biliary tract. The patient was discharged that day.

In the diagnosis of gallstone obstruction the most important thing is that it be considered as a possibility. If one thinks of it, it may be possible to work out a preoperative diagnosis. Until recent years the diagnosis preoperatively was indeed a rarity. Rigler and Borman called attention to air in the biliary passages as indicating the presence of a fistula between the bowel and the biliary tract. Clinically an obstruction that relents and recurs should suggest obturator obstruction. Tenderness is often present when gangrene is starting over the gallstone at the site of obstruction.

Treatment is usually early surgery though occasionally, as in this case, it is not necessary. There is no doubt in my mind that many gallstones pass through the fistula and the bowel, causing only partial obstruction without many symptoms.

Case 9.—A woman, aged forty, had an ovarian cyst removed by a gynecologist on November 25, 1947.

On December 1, 1947, she experienced mild gas pains. They became more severe two days later and were accompanied by emesis. A flat x-ray plate showed distended loops of small bowel.

On December 3, 1947, the patient was seen in consultation. A second operation was performed, and about two feet of the middle portion of the ileum were found glued together by firm adhesions. These were separated.

Convalescence was uneventful.

Obstructions occurring during the postoperative period always present a most difficult problem. This case is presented because it not only is unusual that such firm plastic adhesions should have formed so early, on the ninth day following operation, but also to show the change that has taken place in my feeling about the treatment of simple small bowel obstruction. A few years past we probably would have been content to treat this patient conservatively by an indwelling Levine or gastrointestinal tube—at least for a day or two. Instead, we operated on this patient within a few hours after seeing her. On finding the firm plastic adhesions that caused marked obstruction we had no regrets for doing so.

It is my feeling that in spite of the progress that has been made in making more efficient gastrointestinal tubes and better methods of getting them through the pylorus, that there is a definite trend away from the conservative therapy of intestinal obstruction. While conservative therapy using intestinal intubation often relieves the obstructing mechanism in adhesive obstruction, it is a blind uncertain method even when followed carefully with flat x-ray plate and leukocyte counts. Using this type of therapy one can very easily miss a necrosing adhesive band, a gallstone obstruction, an internal hernia, mesenteric thrombosis, intussusception, volvulus, et cetera. That this change of policy is taking place at the University of Minnesota which has been the center of conservative therapy in simple small bowel obstruction is shown by the following two quotations. Dennis in October 25, 1946, in the *Bulletin of the University of Minnesota Staff Meeting* states, "the general policy at the University hospital is to treat these cases of small bowel obstruction which appear simple, by nasal suction syphonage without operative interference." Dennis in October, 1949, in *Surgical Clinics of North America* states, "with our recent adoption of exploration of nearly all cases of small bowel obstruction, early recognition of strangulation has assumed less importance."

And there are good reasons for this change of attitude. For while the hazards of conservative therapy in simple mechanical obstruction remain constant, the dangers of operation have steadily lessened. Better anesthesia, the antibiotics, and the use of blood have been helpful here as in all types of surgery. Specifically, however, there

are three major advances which have had a real influence. One of these is the aseptic suction enterostomy of Wangensteen which allows one to deflate distended loops of bowel so that one can see the obstructing point and can get at it without injuring distended loops of bowel. This is particularly useful in dealing with adhesive bands located in the pelvis.

The second is the aseptic resection method of Dennis which permits of easy end-to-end anastomosis in loops of bowel of different size. This can be used with little danger of peritonitis in acute obstructions where there has been no chance to prepare the bowel.

The third factor is the development of a better type of gastrointestinal tube and better methods of introducing same. Dr. John Wild has brought out a gastrointestinal tube that is a real improvement. The chief reason for this is that it has only one large suction opening protected on one side by the mercury sac and on the other by the air balloon so that the wall of the bowel is not sucked into the opening, thus plugging it. When this tube is used as an adjunct to the operative treatment of acute small bowel obstruction, it lends a margin of safety that really is a factor. For there is no question but that a well functioning gastrointestinal tube can overcome the toxic effects of distention better than any other method, and it has been amply demonstrated that distention is the major lethal factor in the cause of death in acute intestinal obstruction. For it has been shown, that even in the face of complete obstruction that toxemia and shock are not likely to occur if distention is controlled. Unless a well functioning gastrointestinal tube is used in conjunction with surgery, the toxic effects of distention may persist several days before the bowel can sufficiently regain its tone of function again.

One trouble in the past has been that we have used the tube to treat the obstruction instead of using the tube merely as a means to relieve distention. The fact that at times adequate decompression may so alter the obstructing mechanism so as to allow the obstruction to relent does not alter the fact that suction drainage is actually a means of controlling distention and as such it should be used.

If we keep this thought in mind we can place the intestinal tube in its proper place in our armamentarium used in the treatment of intestinal obstruction. As mentioned above, it has real value when used as an adjunct to the operative treatment of intestinal obstruction. Here it may be either introduced before operation where we may be able to quickly decompress distended loops and thus make our operation easier, or continuing with it or introducing it after operation, we can use it to offset the toxic effects of distention until such time as the bowel can take over its normal function again, often a matter of 4 to 5 days.

Intestinal intubation is the treatment of choice in neurogenic ileus. Here it has almost completely replaced catheter enterostomy for it functions better and is far safer. By a well functioning tube the patient is protected from the lethal factor of distention until such time as the bowel has recovered from the shock that has upset its nervous mechanism and has again started to function.

Another ideal place for the use of the intestinal tube is where an inflammatory mass or a diffuse peritonitis may cause either ileus or mechanical obstruction. In these cases if we can protect our patients from distention, we can tide them over while we use the powerful antibiotics that we now have at our command to control infection.

Dr. Grafton Smith has a new gastrointestinal tube with a removable obturator made up of three wires one of which is used to stiffen the tube and the other two are used to guide the tip in various directions. Using this under fluoroscopic guidance or on the operating table it is possible to direct the tip of the tube in practically any direction. It looks like the best yet.

Case 10.—A woman, aged fifty-eight, dated the onset of lower abdominal pain to the time she had been catheterized at the office of a urologist (November 5, 1948). She was admitted to the hospital on November 8, 1948. There was marked abdominal distention. A cystogram failed to show any perforations of the bladder. A flat plate showed small and large bowel distention. A barium enema failed to show any obstruction in the colon.

A diagnosis of ileus was made and a Wild intestinal tube was inserted. The bowel was deflated in six hours, after which a mass could be felt in the appendix region.

No operation was performed and the mass subsided.

This last case represents a situation where the gastrointestinal tube demonstrated its effectiveness as a means of combating ileus secondary to an inflammatory mass. It had so well decompressed a markedly distended bowel in about six hours time that we were able to feel the appendicial mass and make a definite diagnosis.

In conclusion. if I were to make one plea or to leave one thought it would be for the more judicious use of both Levine and gastrointestinal tubes. A tube should never be put down before you make your diagnosis. As soon as a tube is inserted the picture changes, the patient improves and the physician relaxes. Let the clinical picture develop until you can make a diagnosis. Use every clinical and laboratory and x-ray help that you can command. Then, if you use a gastrointestinal tube, you should do it with a definite therapeutic purpose in mind. If you elect to treat a mechanical obstruction with a gastrointestinal tube, do it realizing that you are walking on thin ice and that you can easily fall into deep trouble.

Meeting of February 3, 1950

At this meeting, the twenty-eighth anniversary dinner meeting, Dr. Warren H. Cole, professor of surgery, University of Illinois, presented a paper entitled "Benign and Malignant Goiter."

Meeting of March 2, 1950

At this meeting Dr. Lawrence M. Larson and Dr. John H. Rosenow presented "Solitary Pyogenic Liver Abscess—Review of Literature and Report of Case." Dr. A. A. Zierold presented "Operating Room Cholangiograms."

Officers were elected as follows: Dr. Harvey Nelson, president; Dr. Robert P. Caron, vice president; Dr. Albert T. Hays, recorder for three years, and Dr. Robert F. McGandy, member of Council for five years.

WILLIAM H. RUCKER, M.D., *Recorder*

Woman's Auxiliary

DR. JUDD SPEAKS AT AUXILIARY WORKSHOP

Mrs. Leonard S. Arling

Approximately 100 county officers and state board members of the Woman's Auxiliary to the Minnesota State Medical association attended the third annual Workshop meeting, October 16, at the Saint Paul hotel.

After the morning board meeting, Auxiliary members heard an inspiring address by Dr. Walter H. Judd, Congressman from the Fifth District, "A Prescription for a Healthy Government." Highlights of Dr. Judd's talk are these:

"I have been thinking much lately of Abe Lincoln's remark at Gettysburg—'We are engaged in a great Civil War, testing whether that nation, or any nation, so conceived and so dedicated can long endure.' Early Americans knew what made this country great, but do the succeeding generations understand what made the American system of government strong? Never has our system of government—the system our forefathers left Europe to found—been in such danger. Our system of government puts primary concern upon the many—government from the bottom up. Our system releases the great creative capacities in each individual. Would a bureaucratic dictatorship select a half-illiterate garage mechanic (Henry Ford) to put the world on wheels? Or would a half-deaf butcher (Edison) have been asked to light the world and produce the phonograph and the movies?

"We are in the midst of a great world conflict and also a conflict within America—the struggle between two philosophies of life: one, that the state should guarantee happiness, security, and keep absolute control of the individual, and two, that the state should only guarantee the right of the individual to pursue happiness, to have the freedom to take risks, to make his own decisions.

"Doctors and their wives have an obligation as citizens of our republic—

Six Obligations

"1. Don't be a radical who says that three-fourths of Americans can afford adequate medical care, one-fourth cannot, therefore let's throw out the whole thing and start over with compulsory health insurance.

"2. Don't be a conservative and say that nothing is wrong.

"3. Be a progressive conservative and strive to keep what is good, continuing to improve what is bad.

"4. Work night and day to show that which is good in our government.

"5. Speak out for the things we believe.

"Karl Marx' ideas changed the world. We can do it constructively as others do it destructively.

"6. Doctors and their wives should help select candidates, work in county and district and state caucuses to nominate candidates. Doctors and their wives should help elect candidates by voting themselves and seeing that others get out and vote."

Mrs. Waas Presides

Afternoon speakers were Mrs. Harold F. Wahlquist, Minneapolis, president-elect, Woman's Auxiliary to the American Medical Association: "Medicine's Educational Program;" Miss Helen K. Johnson, Saint Paul, assistant medical claims manager, Minnesota Medical Service: "Growing Pains;" Allan Stone, Saint Paul, executive director, Minnesota Division, American Cancer Society;" Mrs. James P. Tyrell, Saint Paul, chairman, Board of Directors, Antone Guild: "Our Lady of Good Counsel Cancer Home;" and the main speaker, Mrs. Leo J. Schaefer, Salina, Kansas, first vice president, Woman's Auxiliary to the American Medical Association: "The Auxiliary at Work."

The educational film "Breast Self-Examination" was shown.

Mrs. Charles W. Waas, president, Woman's Auxiliary to the Minnesota State Medical Association, presided at the meeting. Mrs. Roger S. Countryman was chairman.

BLUE EARTH COUNTY AUXILIARY HELPS SPONSOR HEALTH DAY

Mankato's second Health Day, held October 11, was a "Community Mental Health Day," sponsored by the Blue Earth County Medical Society and Auxiliary, Blue Earth-Nicollet Counties' Citizens' Mental Health Committee, District Health Unit No. 2 of the Minnesota Department of Health, Mankato State Teachers College, and the Mankato Branch, American Association of University Women.

Dr. H. J. Nilson, councilor of the Fourth District, Minnesota State Medical Association, presided during the afternoon session.

Outlines State Program

Minnesota's Mental Health Program was outlined by Dr. Ralph Rossen, commissioner of mental health, and Justin Reese, acting secretary, Minnesota Mental Health Council. Two films were shown: "Life With Junior" and "Preface to a Life." The afternoon session concluded with the panel discussion, "The Emotional Development of the Child," Dr. William S. Chalgren, Mankato neurologist and psychiatrist, moderating; Mrs. J. E. Wettleson and Dr. Harry R. Meyering, both of Mankato Teachers College; Rev. Charles L. Duxbury, pastor, First Christian Church, Mankato; Emil M. Meurer, juvenile probation officer, Blue Earth, Nicollet and Le Sueur counties; participating.

How Parents React

Dr. A. A. Schmitz, president, Blue Earth County Medical Society, presided at the evening meeting. Dr. Roger W. Howell, associate professor of neuropsychiatry, University of Minnesota, talked on "Parents' Reactions to Their Children."

Dr. A. G. Liedloff, medical director of District Health Unit No. 2, Minnesota Department of Health, was general chairman. Miss Alberta Marshall of the A.A.U.W. and Mrs. W. B. Kaufman were co-chairmen of general arrangements with a committee made up of members of the medical auxiliary and Citizens Mental Health Committee.

A MESSAGE FROM THE CHAIRMAN

Mrs. Benjamin B. Souster

This year, as in the past, the editors of MINNESOTA MEDICINE are being most generous in the space given us for Auxiliary news. For the continued interest of readers, the Woman's Auxiliary to the Minnesota State

(Continued on Page 1146)

Constipation in the Postsurgical or Bedridden Patient

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RESEARCH IN THE SERVICE OF MEDICINE **SEARLE**

✦ Reports and Announcements ✦

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The regular meeting of the Minnesota Society of Neurology and Psychiatry was held at the Town and Country Club, Saint Paul, on November 14. The scientific program consisted of the presentation of the following papers: "Treatment of Subarachnoid Hemorrhages and Aneurysms" by Dr. Paul S. Blake, Hopkins, and Dr. Lyle A. French, Minneapolis; "Clinical Application of the Electroencephalogram" by Dr. V. Richard Zarling, Minneapolis.

CONTINUATION COURSES

Clinical Chemistry.—The University of Minnesota announces a continuation course in clinical chemistry for internists, pediatricians, and general physicians, December 7 to 9. Dr. John T. Merrill of Boston, Massachusetts, will be the visiting faculty member for the course.

Obstetrics.—A continuation course in obstetrics will be presented at the University of Minnesota on December 15 and 16. The course is intended for general physicians. Visiting faculty members for the course will include Dr. Emil G. Holmstrom, University of Utah Medical School, Salt Lake City, Utah; Dr. Curtis J. Lund, Louisiana State University Medical School, New Orleans, Louisiana, and Dr. Charles E. McLennan, Stanford University Medical School, San Francisco, California.

Geriatrics.—The University of Minnesota announces a continuation course in geriatrics for internists and general physicians January 4 to 6. Distinguished visiting physicians who will participate as faculty members for the course include Dr. E. V. Cowdry, St. Louis, Missouri; Dr. William Dock, Brooklyn, New York; Dr. Nathan Shock, Bethesda, Maryland; Dr. E. J. Stieglitz, Washington, D. C., and Dr. E. L. Tuohy, Duluth, Minnesota.

Clinical Neurology.—Distinguished physicians who will participate as faculty members in a continuation course in clinical neurology to be presented by the University of Minnesota at the Center for Continuation Study from January 29 to February 10 are as follows: Dr. Pearce Bailey, Georgetown University School of Medicine, Washington, D. C.; Dr. H. W. Magoun, University of California Medical School; Dr. Henry Schwartz, Washington University School of Medicine, St. Louis, and Dr. S. Bernard Wortis, New York University Medical Center. Dr. Magoun will also deliver the annual J. B. Johnston lecture on the subject, "Wakefulness and Sleep."

PARKINSON'S DISEASE FOUNDATION

Plans of the newly organized Parkinson's Disease Foundation, with national headquarters at 744 Broad Street, Newark, N. J., were recently announced. Officials stated that plans are being made for setting up units of the Foundation in the major cities of the United States, to provide treatment for persons afflicted with the disease, of whom there are estimated to be one million sufferers.

Medical advisors for the Foundation include Dr. John C. Button, Jr., medical director of the Button Neurological Institute, Orange, N. J., Dr. Thomas Meyers of the Meyers Clinic, and Dr. K. G. Bailey, neurosurgeon of the Los Angeles County Hospital, both of Los Angeles, California.

RICE COUNTY SOCIETY

Dr. J. J. Kolars, Faribault, was elected secretary-treasurer of the Rice County Medical Society at a meeting held in Faribault on September 26. The post of secretary-treasurer was the only office for which an election was held.

The principal topic for discussion at the meeting was the problem of civil defense in the area. Dr. C. W. Rumpf, Faribault, was the principal speaker and moderator in the discussion.

STEARNS-BENTON COUNTY SOCIETY

At the October meeting of the Stearns-Benton County Medical Society, Dr. Gordon R. Kamman, Saint Paul, presented a talk on "Psychosomatic Medicine."

Dr. Reuben F. Erickson, Minneapolis, chairman of the Policy Committee of the Minnesota State Medical Association, was also a guest speaker at the meeting.

WABASHA COUNTY SOCIETY

The eighty-second annual meeting of the Wabasha County Medical Society was held at Wabasha on October 5.

During the afternoon business session officers were elected to serve as follows: Dr. William P. Gjerde, Lake City, president; Dr. Doreen A. Martin, Wabasha, vice president; Dr. W. F. Wilson, Lake City, secretary, and Dr. B. A. Flesche, Lake City, assistant to the secretary. The society members also discussed and endorsed participation in the current educational campaigns and public health programs.

Preceding the evening scientific session, Dr. A. J. Chesley, executive officer of the Minnesota State Board of Health, discussed medical preparedness in civil defense.

The scientific session consisted of the following presentations: President's Address, "Acute Pancreatitis" by the retiring president, Dr. L. M. Ekstrand, Wabasha; "A Review of the More Common Neurologic Disorders" by Dr. L. M. Eaton, Rochester; a color motion picture, "An Improved Technique for the Operative Treatment of Common Anorectal Lesions."

Thirty-two persons attended the dinner held between the business and scientific sessions. During the evening the ladies attending were entertained at the home of Dr. and Mrs. Ekstrand.

WRIGHT COUNTY SOCIETY

Dr. W. E. Hall, Maple Lake, was elected president of the Wright County Medical Society at its meeting at Buffalo on October 10. Also named to office were Dr. Waldo Anderson, vice president, and Dr. Theodore Catlin, secretary-treasurer, both of Buffalo.

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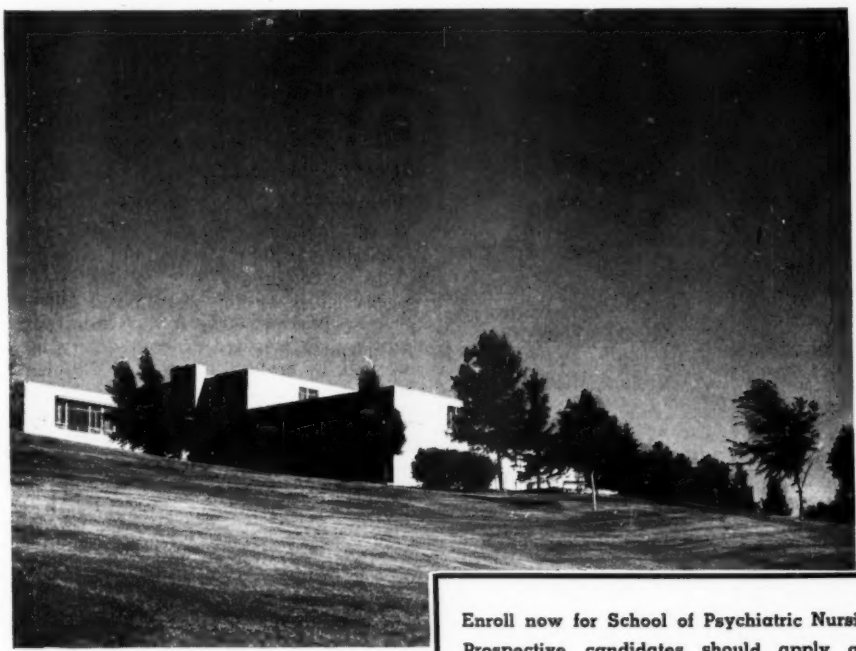

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In Memoriam

OTIS O. BENSON, SR.

Dr. Otis O. Benson, Sr., eighty-three, of Willmar, Minnesota, died in Minneapolis on October 16 following a protracted illness. Uremia was given as the immediate cause of his death. Funeral services were conducted in Minneapolis on October 19 with final interment at Jeffersonville, Ohio.

Dr. Benson was born in 1867 at Jeffersonville. He took his B.A. degree from Ohio Northern University at Ada, Ohio. He also graduated from the University of Iowa in 1898, and from Rush Medical College in 1902. A life-long member of the American Medical Association, he retired in 1947 after more than forty-five years practice.

He is survived by two children: Brig. Gen. Otis O. Benson, Jr., Commandant of the U. S. Air Force School of Aviation Medicine, Randolph AFB, Texas, and Mrs. L. A. Utrecht of South Charleston, Ohio.

NIMROD A. JOHNSON

Dr. Nimrod A. Johnson, a surgeon in Minneapolis prior to his retirement in 1936, died at his home in Santa Monica, California, September 6, 1950, following a cerebral hemorrhage.

Dr. Johnson was born in Saint Paul, October 1, 1880. He graduated from the University of Minnesota medical school in 1905, and interned at Swedish Hospital, Minneapolis. He practiced general surgery in Minneapolis and with his brother, Dr. Norton T. Johnson, founded the Bloomington-Lake Clinic.

Dr. Johnson was an affiliate member of the Hennepin County Medical Society, the Minnesota State Medical Association, the American Medical Association and the American College of Surgeons. He was also a Mason and a member of the Scottish Rite and Zuhrah Temple of the Shrine.

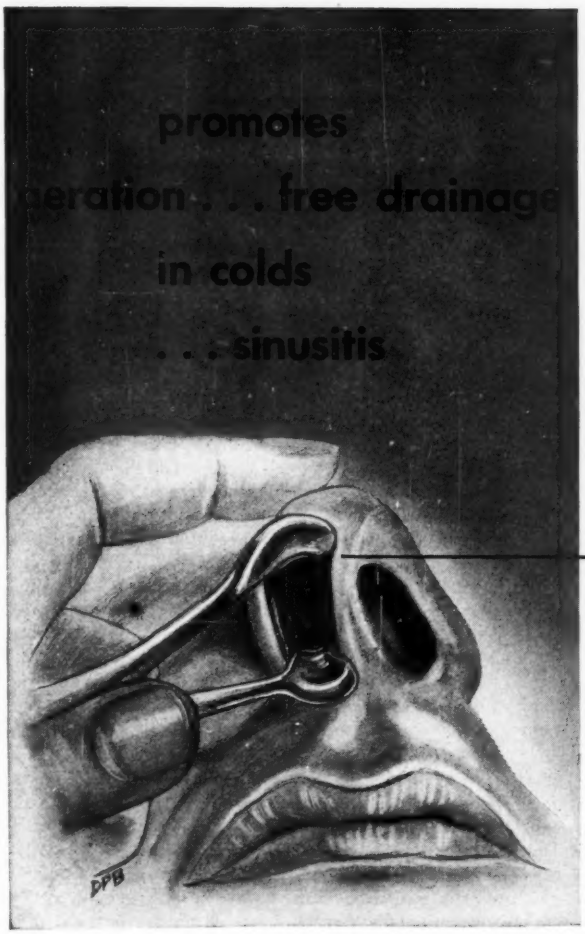
Besides his brother, Dr. Johnson is survived by his wife, Florence, and two daughters, Mrs. Clifford F. Traff, Minnetonka Beach, and Mrs. Jerome Hiniker, Falls Church, Virginia.

WOMAN'S AUXILIARY

(Continued from Page 1142)

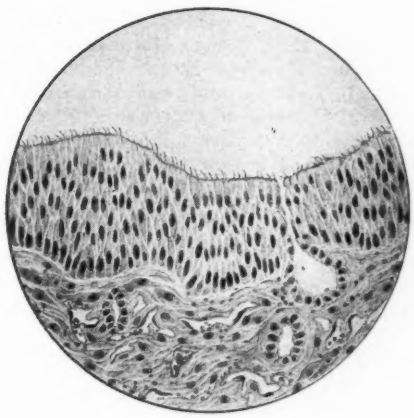
Medical association is eager to hear from every county in the state.

Articles on newly organized Auxiliaries and plans for the coming year will be greatly appreciated, as well as information about local meetings, programs and Health Days. These may be sent to Mrs. B. B. Souster, 1333 Bohland Place, Saint Paul 5, Minnesota. Personal news items may be sent to the chairman of the Newsletter, Mrs. L. S. Arling, 2310 E. 43rd St., Minneapolis, Minnesota.



Nasal membrane showing increased leukocytes with denudation of cilia.

Normal appearing nasal epithelium.



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Of General Interest

Dr. Philip S. Hench and **Dr. Edward C. Kendall,** of the Mayo Clinic, and **Dr. Jadeusz Reichstein,** of the University of Basel, have been awarded the Nobel Prize in medicine for 1950. The prize money, amounting to 164,303 crowns ($31,715), will be divided between the three doctors and presented to them at Stockholm on December 10. It was Dr. Kendall who discovered cortisone about ten years ago and Dr. Hench who applied it clinically in the treatment of rheumatoid arthritis. Dr. Reichstein shared in the development of the chemistry of the extracts.

* * *

Word has been received that **Dr. Alexander M. Boysen,** a graduate of the University of Minnesota Medical School in 1948, was reported on July 12 as missing in action in Korea. Six weeks later notification was received by his wife that Dr. Boysen was being held as a prisoner of war.

A native of Minnesota, Dr. Boysen served his internship at St. Francis Hospital, Pittsburgh, Pennsylvania. He then accepted a three-year Army clinical residency and was assigned to Madigan General Hospital at Fort Lewis, Washington. He was sent to Yokohama, Japan, in May of 1950 for ninety days of temporary duty. While there he was assigned to the 24th Infantry Division and sent to Korea. At the time of his capture by the North Koreans he held the rank of captain in the medical corps.

* * *

On October 4, **Dr. John F. Madden,** Saint Paul, spoke before the permanent and consulting staffs of the Veterans Hospital at Lincoln, Nebraska, on the subject, "Cutaneous Manifestations of Internal Diseases."

* * *

Dr. C. G. Uhley, Crookston, spoke on a radio program entitled "Cancer on Trial," which was presented over station KROX, Crookston, on September 20. Dr. Uhley is the local chairman for the Minnesota Division of the American Cancer Society.

* * *

Dr. William F. Braasch of Rochester was named president of the Minnesota Public Health Association at its annual meeting in Coffman Memorial Union, October 24. He succeeds Edward A. Knapp, Saint Paul attorney, who has been president for several years.

* * *

Dr. John M. Fallon of Wooster, Massachusetts, was elected president of the **Mayo Foundation Alumni Association** at the annual meeting on October 20. Other officers elected were Dr. John L. Kleinhechsl, Wichita, Kansas, first vice president; Dr. Nat H. Copenhaver, Bristol, Tennessee, second vice president; Dr. James F. Weir, Rochester, secretary, and Dr. Edward S. Judd, Rochester, associate secretary and treasurer.

Dr. Thomas J. Kinsella, Minneapolis, is retiring president.

* * *

Six nurses with many years of service to the cause of tuberculosis were honored with a dinner in Coffman Memorial Union on October 24. Two Saint Paul nurses are Sibba Axford, chief nurse at Mineral Springs Sanatorium at Cannon Falls from 1924 to 1948 and who is now a supervisor at St. Luke's hospital in Saint Paul, and Margaret Weikert, resident director of the Ramsey County Childrens Preventorium and a staff member there for thirty-three years. The four others are: Mrs. Sue T. Naysmith, head of the department of nursing at Glen Lake Sanatorium from 1920 until her retirement in 1941; Mathilda Hallberg, who is now employed at Southwestern Minnesota Sanatorium in Worthington; Alice Sorenson, chief nurse at Granite Falls; and Lulu Healy, who was chief nurse at Minnesota State Sanatorium, Ah-Gwah Ching, from 1917 until 1940.

More than 200 Christmas seal workers from all Minnesota counties attended the dinner and were addressed by Leigh Mitchell Hodges, Philadelphia columnist and one of the founders of the Christmas seal campaign. Dr. E. M. Hammes, Sr., presided at the meeting which was in connection with a course in tuberculosis control for lay persons given at the University.

* * *

Dr. Dewey E. Moorehead of Owatonna was elected grand high priest of the Minnesota Royal Arch Masons at the annual meeting of the organization in Saint Paul on October 10.

* * *

Dr. Lloyd S. Nelson, Minneapolis, spoke on "Rheumatic Fever in Children, with Special Emphasis on the Differential Diagnosis" at a meeting of the Lyon-Lincoln County Medical Society at Marshall on October 10. The meeting was part of the forty-second semi-annual clinic course sponsored by the society.

* * *

Dr. Carl J. Lind, formerly of Minneapolis, has been promoted from lieutenant colonel to colonel at the Brooke Army Medical Center, Fort Sam Houston, Texas, where he is chief of the laboratory service. A graduate of the University of Minnesota Medical School, Dr. Lind took four years of postgraduate work in surgery and roentgenology at the university. He also specialized in pathology.

* * *

Dr. W. F. Mercil was away from Crookston during the last two weeks of September while he at-

(Continued on Page 1150)

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(Continued from Page 1148)

tended meetings of the Central Obstetrical and Gynecological Society at Milwaukee and at Chicago. He also attended a three-day conference at the University of Minnesota Center for Continuation Study.

* * *

September 16 was Dr. Farrish Day at Sherburn. On that day **Dr. Robert C. Farrish,** who has completed fifty years of medical practice, celebrated his eighty-third birthday and received congratulatory messages from his friends. The day was proclaimed in his honor by the mayor of Sherburn.

* * *

Dr. John J. Bittner, director of cancer biology at the University of Minnesota and George Chase Christian professor of cancer research, was presented with the second annual Minnesota award of the American Cancer Society at a dinner in Coffman Memorial Union on September 22.

* * *

Technicians, nurses, bookkeepers, secretaries and receptionists employed by members of the Hennepin County Medical Society have organized a new group, the **Medical Assistants of Hennepin County.** First president of the organization is Dorothy Reid. Civil defense volunteer work with the Red Cross is one of the first projects of the group.

* * *

Dr. Russell J. Moe, Duluth, became president of the Central Association of Obstetricians and Gynecologists at its annual meeting in Milwaukee late in September. Dr. Moe was named president-elect at the 1949 meeting of the group in St. Louis. He has been a member of the executive committee since 1941.

* * *

Late in September **Dr. Chester J. Olson** moved his office and residence into his newly constructed, combination office-and-home building in Belle Plaine. The modern structure contains twelve rooms, six used for the office and six for living quarters. The entire building is heated by a radiant heating system.

* * *

The private duty nurses of the **Minnesota Nurses Association** decided at their meeting held in the Nicollet Hotel, Minneapolis, in October, to raise their rates, effective in the near future. The fee for the eight-hour periods from 7 a.m. to 3 p.m. and 11 p.m. to 7 a.m. will be increased from $10 to $12, and the shift from 3 p.m. to 11 p.m., from $11 to $13. They also decided that when more than one patient is being nursed the rate will be $16 for the shifts of 7 a.m. to 3 p.m. and 11 p.m. to 7 a.m., and $17 for the 3 p.m. to 11 p.m. shift. Also, types of nursing which formerly required an additional dollar, such as the nursing care of a mother and baby, tuberculosis patients and those with contagious diseases, drug addicts, alcoholics and mentally ill now will require two dollars additional.

* * *

Dr. Harold S. Diehl, dean of medical sciences at the University of Minnesota, was appointed by the

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Municipal Bonds and Inflation

Perhaps the most common problem confronting an investor today concerns the problem of inflation and its eventual effect upon his savings. Mr. Phillips Barbour, Editor of the Bond Buyer, addressed the Municipal Forum of the National Security Traders Association recently on this problem—the quotations below are from this address:

"No sure way to avoid the ravages of inflation, if present, has yet been discovered. Our discussion today is not intended to find a cure for the malady, however, but to point out some of the reasons municipal bonds, in my opinion, will aid the American investor greatly in maintaining an investment portfolio in as healthy a condition as is possible in the present inflation and why he should not put all his eggs in the equity basket.

"Investments of many kinds have been suggested as suitable in these circumstances . . . none supplies the perfect solution in practice. The more popular suggestions include real estate, farm lands, growing trees, aging liquor, breeding live stock, jewels and precious stones, works of art and, of course, commodities and common stocks or equities.

"The ideal investment, under present conditions, is one which provides:

(1) Safety of principal—that is the most important requisite.

(2) Dependability of income—the larger the better, but regardless of size, it should be dependable.

(3) Opportunity for growth—in both principal and interest.

(4) It must be realistic. There is a limit to the number of investors who can breed cattle, for instance.

"Obviously, the majority of the suggestions I have mentioned do not fit entirely satisfactorily into the pattern of requirements specified. Where they may possess one good feature, they are deficient in others.

"Even after determining the category to be used, the problem of choosing the particular unit, or units, to be bought is often the block over which the buyer stumbles. A decision must be made as to the particular farm, commodity, work of art, or stock, which should be bought after the die is cast, as to the category which is practicable for the investor to employ. All oil stocks don't invariably go up or all real estate always improve in value."

That portion of Mr. Barbour's address showing how municipal securities meet the requirements of the ideal investment outlined above, will appear in the next article.

We have reprints of Mr. Barbour's address available and will be pleased to send you one, without obligation, upon request.

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President on October 4 to a seven-member commission to advise Selective Service on the drafting of physicians and dentists for the armed forces. The commission is headed by Dr. Howard Rusk, physician-writer for the *New York Times*.

* * *

Dr. Russell O. Sather, Crookston, presented one of the panel discussions on practical problems of health officers at a meeting of Minnesota health officers in Minneapolis on September 25. Dr. Sather's topic was "Small Town Housing."

* * *

Excavation for construction of a new office building in North Saint Paul began late in September. When completed, the building will house the offices of **Dr. A. E. Muller** of North Saint Paul.

* * *

The city council of Biwabik on October 2 accepted the resignation of **Dr. R. B. Bray** as health officer and approved the hiring of **Dr. S. C. Blackmore** as health officer. Dr. Bray's resignation followed his announcement that he had sold his hospital and was moving to Rapid City, South Dakota (see Hospital News).

* * *

This year, as in previous years, the **Ramsey County Medical Society**, not content to let the Community Chest campaign alone, sent letters to all members

of the society, urging them to contribute generously to the Community Chest. In addition, a special committee of the society organized speeches by campaign leaders to the medical staffs of the city's hospitals. Such direct solicitation by the medical society, it was announced, has raised the percentage of participation of doctors in Saint Paul to 86, in contrast to a 64 per cent average in thirty-one selected cities.

* * *

It was announced on September 14 that **Dr. George L. Stuhler** had become associated in practice with Dr. N. T. Norris of Caledonia. Dr. Stuhler, it was stated, would remain in Caledonia until the time arrives for him to begin his fellowship at the Mayo Clinic. A graduate of the University of Minnesota Medical School, he served his internship at the Detroit Receiving Hospital.

* * *

Dr. Frederick L. Behling, Oklee, attended a short course in diseases of children at the Children's Memorial Hospital in Chicago during the middle of September.

* * *

Dr. William S. Chalgren, Mankato, was the principal speaker at a meeting of the fifth district of the Minnesota Nurses' Association in Mankato on September 11. Dr. Chalgren's topic was "Mental Mechanism."

* * *

Appointment of **Dr. Charles W. Mayo,** Rochester, to the board of judges for the annual Dr. C. C. Criss award was announced on October 25 by the Mutual Benefit Health and Accident Association of Omaha, Nebraska. The award, named for the founder of the firm, consists of $10,000 and a gold medal and goes to the individual who, in the judges' opinion, has made the greatest contribution to public health and/or safety during the year.

* * *

Dr. Lloyd C. Gilman, Willmar, left for Chicago on October 9 to take a two-week postgraduate course in fractures at the Cook County Hospital.

* * *

Sanborn lost its only physician on October 21 when **Dr. Aldridge F. Johnson** moved to Indianapolis to become assistant superintendent of the Sunnyside Tuberculosis Sanitorium there. Dr. Johnson, who formerly was on the staff of the state sanitorium at Roseau, practiced at Sanborn for almost two years.

* * *

Dr. A. J. Chesley, director of the Minnesota Health Department, and his assistant, **Dr. Robert Barr,** attended the United States Public Health Service Conference in Washington, D. C., October 23 through 27. Medical aspects of civil defense were discussed at the conference.

* * *

An address by **Dr. John E. Haavik,** Duluth, was a feature of a meeting of the Duluth Multiple Sclerosis Club on September 19.

* * *

Dr. Karl R. Lundeberg, former resident of Minneapolis and a graduate of the University of Minnesota Medical School, has been named director of preventive medicine at the Army's medical field service school, Fort Sam Houston, Texas.

* * *

The **Mayo Clinic emeritus staff** now numbers thirty-one members, seven of whom no longer live in Rochester.

* * *

Construction has been completed on the new office building of **Dr. E. E. Zemke** and **Dr. William Misbach** in Fairmont. The modern-designed structure houses two consultation rooms, four examining rooms, laboratory, first aid room, pediatric room, rooms for x-ray and other diagnostic apparatus, and an office suite for a dentist.

* * *

Both the Hennepin County and Ramsey County Medical Societies now offer a **telephone answering service** to enable the public to obtain immediate medical attention at any hour of the day or night. The service is designed to aid persons who cannot reach their own physician—or do not have one—when a medical emergency arises. The service is especially valuable to persons who have recently moved to Minnapolis or Saint Paul and who do not know a physician.

The telephone number of the service in Saint Paul, conducted by the Ramsey County Medical Society,

(Continued on Page 1154)

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Our Recommendations

Based upon our experience in liquidation of accounts prior to, during, and after World War II

(1) Concentrate effort on the collection of accounts against patients who may be called in the Armed Forces.

(2) THE TIME TO COLLECT IS NOW because with inevitable continued inflation, increased salaries and wages, farm prices, commodity prices, there will be more money in circulation.

(3) That if you already have been called into the service or anticipate being called that you permit this qualified organization to act as your liquidating agent.

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(Continued from Page 1152)

is CEdar 5751. The number of the Minneapolis exchange, operated by the Hennepin County Medical Society, is FIllmore 1411.

Any patient who is cared for by a physician on one of these emergency calls is billed only by the individual physician. There is no charge for the special telephone service, which is offered to each community as a public service by the members of the two medical societies.

* * *

Dr. A. G. Sanderson has resigned as superintendent of the Deerwood Sanatorium and has accepted a position on the staff of the Anoka State Hospital.

* * *

Dr. Raymond C. Magnuson and Miss Janet Joyce Widen, daughter of Dr. W. F. Widen of Minneapolis, were married in Minneapolis on September 16. They are now living in Cambridge. Dr. Magnuson is a graduate of the University of Minnesota Medical School.

* * *

Dr. F. Lionel Pickett, a general practitioner in England, was guest speaker at a meeting of the Kiwanis Club in Duluth on September 13. He stated that he disliked the British medical plane "intensely," and he pointed out that the program is defective because: (1) it will probably ruin England financially since it already operates at a loss of $900,000,000 annually; (2) the health of British people is deteriorating under the plan; (3) specialists have a far too heavy patient load and are being forced to become general practitioners.

* * *

Dr. Curtis M. Johnson, formerly of Jackson, has become affiliated in practice with Dr. M. I. Hauge at the Clarkfield Clinic.

* * *

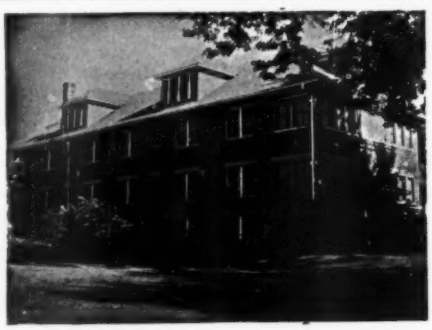
A law providing for vitamin and mineral enrichment of all bread offered for public sale was urged by **Dr. Russell M. Wilder,** Rochester, at a meeting of the American Bakers Association in Chicago on October 17. Dr. Wilder said that the dietary qualities of enriched bread should be improved through the use of more non-fat milk solids.

* * *

Dr. Walter H. Judd, Representative from Minnesota's Fifth District, was a featured speaker at the third annual Workshop of the Woman's Auxiliary to the Minnesota State Medical Association in Saint Paul on October 16. The title of his talk was "A Prescription for a Healthy Government."

* * *

Four Rochester physicians were guest speakers at the fifteenth annual assembly of the United States Chapter, International College of Surgeons, in Cleveland from October 31 to November 3. The four speakers were Dr. Virgil S. Counseller, Dr. Stuart W. Harrington, Dr. John S. Lundy, and Dr. Gershom J. Thompson. President-elect of the organization is Dr. Henry W. Meyerding of Rochester.



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Dr. L. R. Gowan — **Dr. C. M. Jessico**
Dr. J. E. Haavik — **Dr. L. E. Schneider**

The late **Dr. E. H. Loofbourrow,** former Keewatin school physician, was honored at a memorial program staged by Keewatin students on September 21. A feature of the program was the presentation of a picture of Dr. Loofbourrow to the school by the Keewatin High School Class of 1950. Dr. Loofbourrow, who was school physician from 1915 to 1948, died last year.

* * *

Dr. Loren J. Larson moved to Buffalo during the middle of October and became associated in practice with Dr. John J. Catlin and Dr. Theodore J. Catlin. A graduate of the University of Minnesota Medical School, Dr. Larson has practiced in Watertown for the last two years.

* * *

Dr. David P. Anderson, Austin, was elected to the state board of directors of the Minnesota Division of the American Cancer Society at a meeting of the group in Minneapolis on September 22.

* * *

Dr. Maurice N. Walsh, formerly of Rochester, has become chief of medical neurology for the Veterans Administration in Topeka, Kansas, and a training candidate in the Topeka Institute of Psychoanalysis, Menninger Foundation.

Dr. Walsh, a graduate of the Detroit College of Medicine and Surgery, moved to Rochester in 1934 where he became a fellow in medicine at the Mayo Clinic. Later he transferred to neurology and became a member of the staff in 1937. During World War II he served as a psychiatrist with the Army Air Force in the South Pacific area.

* * *

It was announced on September 22 that **Dr. Joseph S. Emond** of Farmington was moving his offices to a new location in the city. The new offices, in the Feely Building, were being completely remodeled and redecorated.

* * *

The two new **geriatrics buildings** at the Rochester State Hospital were dedicated on November 2, with Governor Luther W. Youngdahl as the principal speaker. At the ceremonies, held in the administration building's auditorium, thirty-six persons who have been employed at the hospital for twenty-five years or more were also honored.

* * *

In Blackduck, **Dr. Harry A. Palmer** has moved his offices into his newly completed building, the Blackduck Clinic. The modern-designed structure contains eleven rooms, including reception room, treatment rooms, x-ray room, private offices, and a dental suite. The dental suite is occupied by Dr. S. L. Conley.

* * *

Two former fellows in the Mayo Foundation were awarded alumni association prizes at a reunion in Rochester on October 19. **Dr. C. A. M. Hogben,** now a National Research Council fellow in medical sciences in Denmark, was given a prize for a paper entitled "The Renal Excretion of Phosphate." **Dr.**

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B. H. Scribner, now a first assistant in medicine at the Mayo Clinic, was awarded a prize for research on the application of water chloride balance technique to the clinical management of problems of fluid balance.

* * *

Before **Dr. Edwin Rose,** chief medical officer of the Minneapolis Veterans Hospital, was transferred to the Washington office of the Veterans Administration, he was honored at a dinner in Minneapolis on October 18 given by members of the Minneapolis chapter of the Disabled American Veterans.

* * *

Dr. Ralph J. Gampell, former British physician, discussed socialized medicine under bureaucratic control at a meeting of the Saint Paul Association of Commerce on October 20. Dr. Gampell, who left England in April, 1949, "to find freedom in medicine as well as freedom as an individual," as he states, spoke under the auspices of the national education campaign of the AMA. He is now a resident of San Francisco, where he recently completed an internship and was licensed to practice.

* * *

Almost immediately after moving to Bagley to be associated in practice with Dr. L. J. Larson, **Dr. George Miners** left for North Carolina in September to complete a ten-week course for a degree for which he had been working. Following completion of the course, he expects to return to Bagley to begin permanent practice.

His colleague, **Dr. L. J. Larson** of Bagley, was honored for his twenty-five years of service in the community at a banquet given by the Bagley Civic and Commerce Association on September 12. Dr. K. W. Covey, Mahnomen, was the principal speaker at the banquet.

* * *

Dr. O. K. Behr, Crookston, discussed the subject, "Know Your Heart," on a radio broadcast over station KROX, Crookston, on October 18.

* * *

A cancer teaching clinic for members of the medical profession from Minnesota and Wisconsin was held in Duluth on October 18. The principal speaker at the meeting was **Dr. Alexander Brunschwig,** professor of clinical surgery at Cornell University Medical College, who spoke on "Radical Surgery in Advanced Cancer of the Female Genital Tract." The clinic was sponsored by medical societies of Minnesota and Wisconsin and by the state health departments and the state divisions of the American Cancer Society.

* * *

Dr. Edwin G. Knight, Swanville, who was injured in an automobile accident on September 1, returned to his home on September 17, expecting to be back in his office on a limited basis within a short time. It was expected, however, that a few weeks would pass before his fractured right arm would heal sufficiently to enable him to assume his full duties.

(Continued on Page 1158)

An Observation on the Accuracy of Digitalis Doses

Withering made this penetrating observation in his classic monograph on digitalis: "The more I saw of the great powers of this plant, the more it seemed necessary to bring the doses of it to the greatest possible accuracy."[1]

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1. *Withering, W.:* An account of the Foxglove, London, 1785.
2. *Rimmerman, A. B.:* Digilanid and the Therapy of Congestive Heart Disease, Am. J. M. Sc. *209:* 33-41 (Jan.) 1945.

Literature giving further details about Digilanid and Physician's Trial Supply are available on request.

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Surgical Technic, Surgical Anatomy and Clinical Surgery, four weeks, starting November 6, February 5.
Surgical Anatomy and Clinical Surgery, two weeks, starting November 20, February 19.
Surgery of Colon and Rectum, one week, starting November 27.
Gall-Bladder Surgery, ten hours, starting April 23.

GYNECOLOGY—Intensive Course, two weeks, starting February 19.
Vaginal Approach to Pelvic Surgery, one week, starting March 5.

OBSTETRICS—Intensive Course, two weeks, starting March 5.

RADIATION PHYSICS—Intensive Review Course, four days, starting November 29.

ROENTGENOLOGY—Diagnostic and Lecture Course first Monday of every month.
Clinical Course third Monday of every month.
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(Continued from Page 1156)

Dr. Viktor O. Wilson, health officer of the Rochester-Olmsted County Public Health Unit, was elected president of the Minnesota Public Health Conference in Minneapolis on September 25 and 26. He succeeds Dr. F. W. Behmler of Morris.

* * *

Dr. Kenneth L. Buresh, formerly of Baxter, Iowa, moved to Westbrook early in September and began practice. He and Dr. John V. Carlson, the only other physician in Westbrook, are occupying new offices in a recently remodeled building in the city. Dr. Buresh is a graduate of the University of Iowa.

* * *

Forty-three years of medical practice in Detroit Lakes were ended late in October when **Dr. James E. Carman** closed his offices and moved to Glendale, California. A graduate of the University of Minnesota Medical School, Dr. Carman began his Detroit Lakes practice in 1907, a few years after his graduation.

* * *

The week of November 12 to 18 was designated as **Diabetes Detection Week,** during which the American Diabetes Association and its affiliates conducted the annual diabetes detection drive with the co-operation of the nation's physicians. All persons were asked to go to their own physicians for free diabetic examinations. In many cities arrangements were made with the city health department to examine urine specimens, and drug stores were designated as collection depots for the specimens. By such methods members of the national organization expected to discover about a million persons throughout the country who have diabetes without knowing it.

* * *

More than 200 guests attended an open house given for **Dr. Gustave L. Rudell,** Minneapolis, in honor of his seventy-fifth birthday on September 24. Born in Sweden, Dr. Rudell came to America in 1892 and attended the University of Minnesota Medical School. He is still actively engaged in his medical practice.

HOSPITAL NEWS

It was announced in Biwabik late in September that the **Biwabik Hospital** had been sold by Dr. Robert B. Bray to Dr. Sidney C. Blackmore. Dr. Blackmore, who has been associated in practice with Dr. Bray for the past five years, said that the operation of the hospital would continue in the same manner as in the past.

Dr. Bray, who has been owner and manager of the hospital for the past thirteen years, since the death of his father, the late Dr. C. W. Bray, planned to remain in Biwabik until an assistant could be found for Dr. Blackmore. He then planned to move to Rapid City, South Dakota.

The hospital, one of the first to be built on the Mesabi Range, was originally constructed about

(Continued on Page 1160)

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(Continued from Page 1158)

1892. The building was destroyed by fire in 1906 and was rebuilt by Dr. C. W. Bray. The Bray family has owned the hospital since that time.

* * *

Dr. D. E. Stewart, a member of the Northwestern Clinic staff in Crookston, was elected president of the medical staff for **Bethesda Hospital,** Crookston, at a meeting on September 26. Other officers include Dr. G. S. Boyer, vice president, and Dr. A. R. Jensen, secretary, both members of the Northwestern Clinic staff.

* * *

Dedication ceremonies for the new twenty-one bed **Wheaton Community Hospital** were held in Wheaton on October 2. Ceremonies included a program at the school auditorium and a tour of the hospital.

* * *

Construction of a million-dollar addition to **St. John's Hospital,** Saint Paul, is expected to begin about March 1. The new wing will house seventy-five beds, a children's section, physical therapy department, a new chapel, and increased surgical, obstetrical, laboratory, administrative and service space.

* * *

An organizational meeting of the medical staff of the new **Wells Hospital** was held in Wells on October 5. Officers were elected as follows: Dr. Richard P. Virnig, chief of staff; Dr. William H. Barr, vice president, and Dr. Mark P. Virnig, secretary-treasurer, all of Wells.

BLUE CROSS-BLUE SHIELD NEWS

Enrollment in Minnesota Medical Service, Inc., as of August 31, 1950, was 372,187, an increase of 111,686 to date this year. Blue Cross enrollment as of the same date totaled 1,029,718 participant subscribers.

Payments to doctors for the month of August totaled $193,848 or 66.8 per cent of cash earned income and to date this year payments total $1,321,836 or 71 per cent of the cash earned income compared with $676,694 or 73.8 per cent for the same period last year. Blue Shield claims for the month of August totaled 4,911 and provided payment for 5,877 medical-surgical services, an increase of 299 claims or 405 services over the July payment. The total amount paid during the month amounted to $193,847.65, an increase of $20,544.33 over the month of July. The first eight months of 1950 Blue Shield claims totaled 33,358 cases in the amount of $1,321,836.17.

Payments to unlimited subscribers amounted to 28.3 per cent of the total payments to doctors during August. The payments to doctors for unlimited subscriber claims paid during the first eight months of 1950 totaled $391,443.52 or 29.6 per cent of the total payments compared with 19.3 per cent during the same period of 1949.

During the month of August payment was made for 466 tonsillectomies. The number of surgical services paid during the month increased from 3,123 or 57.1 per cent in July to 3,285 or 55.9 per cent in August. 3,776 claims or 76.9 per cent of the total paid were incurred in hospitals during August compared with 77.1 per cent during July. Payments for these hospitalized cases totaled $176,850.15 compared with the July total of $158,448.07. Claims for services rendered in doctor's offices totaled 1,121 or 22.8 per cent of total compared with 22.3 per cent during July.

On the year to date figures we show that 32,015 claims have been paid to participating doctors in a total amount of $1,258,173.37 with 652 claims being paid to non-participating doctors in the amount of $33,864.08 and 691 claims in the amount of $29,798.72 being paid to out-of-state doctors.

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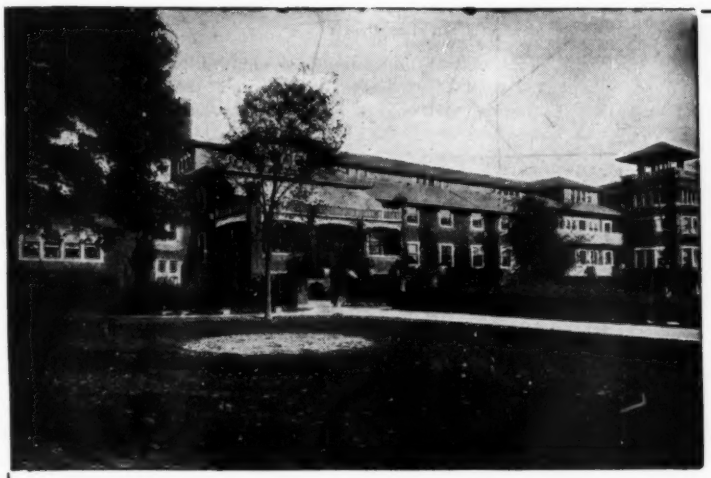

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

PRINCIPLES AND PRACTICE OF SURGERY. Jacob K. Berman, A.B., M.D., F.A.C.S., Associate Professor of Surgery, Indiana University School of Medicine; Associate Professor of Oral Surgery, Indiana University School of Dentistry; Chief Consultant in Surgery, Billing's Veterans Administration Hospital, Fort Benjamin Harrison, Indiana; Director of Surgical Education and Surgical Research, Indianapolis General Hospital. 1378 pages. Illus. Price $15.00, cloth. St. Louis: C. V. Mosby Co., 1950.

PROGRESS IN GYNECOLOGY. Volume II. Edited by Joe V. Meigs, M.D., Clinical Professor of Gynecology, Harvard Medical School; Chief of Staff of Vincent Memorial Hospital, the Gynecological Service of the Massachusetts General Hospital: Surgeon, Pondville Hospital; Gynecologist, Pamer Memorial Hospital; and Somers H. Sturgis, M.D., Clinical Associate in Gynecology, Harvard Medical School; Assistant Surgeon, Massachusetts General Hospital, Boston. 821 pages. Illus. Price $9.50, cloth. New York: Grune & Stratton, 1950.

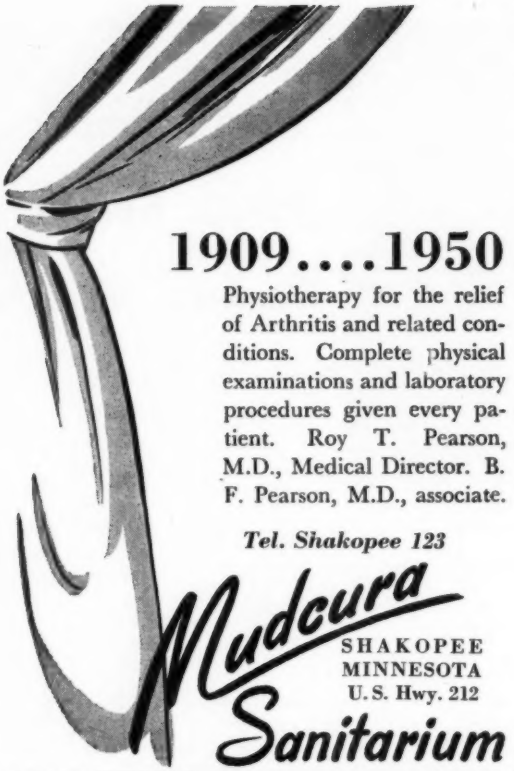
MANAGEMENT OF OBSTETRIC DIFFICULTIES. Fourth Edition. Paul Titus, M.D. Obstetrician and Gynecologist to St. Margaret Memorial Hospital, Pittsburgh; Consulting Obstetrician and Gynecologist to the Shadyside Hospital, Pittsburgh; Secretary of the American Board of Obstetrics and Gynecology; Member Reserve Consultants Advisory Board, Bureau of Medicine and Surgery, United States Navy (Captain, MC, USNR). 1046 pages. Illus. Price $14.00, cloth. St. Louis: C. V. Mosby Co., 1950.

OSLER APHORISMS, From His Bedside Teachings and Writings. Collected by Robert Bennett Bean, M.D.; edited by William Bennett Bean, M.D. 158 pages. Price $2.50, cloth, New York: Henry Shuman, Inc., 1950.

NATIONAL FORMULARY—Ninth Edition. 877 pages. Illus. Price $8.00 ($8.75 outside United States), cloth. Washington, D. C.: American Pharmaceutical Association, 1950.

THE ANTIHISTAMINES; THEIR CLINICAL APPLICATION, by Samuel M. Feinberg, M.D., Associate Professor of Medicine, Chief of Division of Allergy and Director of Allergy Research Laboratory; Saul Malkiel, Ph.D., M.D., Assistant Professor of Medicine, Director of Research, Allergy Research Laboratory; Alan R. Feinberg, M.D., Clinical Assistant in Medicine, Attending Physician in Allergy Clinic, Northwestern University Medical School. 291 pages. $4.00. Chicago: The Year Book Publishers, Inc., 1950.

"The Antihistamines" by Drs. S. M. Feinberg, S. Malkiel and A. R. Feinberg is a concisely written book covering the subject adequately. The monograph is divided essentially into two divisions. The first section deals with experimental studies in relation to histamine and antihistamines, while the second section deals with clinical observations as noted by the authors and other investigators. In the section dealing with experimental studies, the following subjects are covered sufficiently, but each topic is not delved into deeply: (a) Histamine and its role in allergy, (b) The chemistry of the antihistamines, (c) The pharmacology of the antihistamines, (d) The antihistamines in experimental hypersensitivities, and (e) The bioassay of antihistamines in man. In the section discussing the clinical observations the following factors and conditions are covered: (a) Respiratory allergy, (b) Dermatoses, (c) Miscellaneous medical manifestations, (d) Administrations and recommended dosage of the various drugs, (e) and The toxic effects of the commonly used antihistamines. Besides the two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main divisions in the book, there is a lengthy, complete (to date), useful appendix that lists all American-produced antihistamines (prescription, not over the counter packages) along with their accepted dosage, and the name of the pharmaceutical company that markets them. The bibliography lists 583 references which represents a good sampling of the over-abundant current and historical literature on the subjects discussed in the text.

The book itself is well-organized and follows a definite pattern; however, each chapter could be read independently without disrupting any continuity of thought. There is a tendency toward repetition in some of the clinical as well as the experimental chapters, and this might detract partially if one reads the book through from cover to cover. However, if one uses the book as a reference manual, this fault then becomes a benefit, as one is able to find a more complete scope of information by reading only the chapter in which he might be interested at the time.

This manuscript is one that is well worth having on any library shelf, but like so many books written on a subject that changes rapidly and progresses quickly, its clinical value is lost and outmoded soon after being released from the press, and it readily becomes a historical reference rather than a current digest.

IRVINE M. KARON, M.D.

PARKINSON'S DISEASE. Advice and Aid for Sufferers of Parkinson's Disease and Other Physical Disabilities. By Walter Buchler. 75 pages. Price $1.00 and $2.00 cloth. Mr. Walter Buchler 101, Leeside Crescent, London, N. W. 11, England.

This little book is the author's account of his experiences as a patient with Parkinson's disease and his recommendations, advice, and philosophy arising therefrom. Most of the chapters are written in the second person. The book covers a wide range of subjects—aids in walking, care of the feet, manner of dress and style of clothing most suitable to the sufferer, diet, "table tactics" housing, furniture, planning for work, entertainment, and social events.

The information in this book is not new, but it reminds the physician that treating a patient with physical disability involves much more than drug therapy. The importance of management of the patient as a person is the primary consideration, and some helpful topics for consideration are found here. For the patient, this book offers some helpful hints as well as sympathetic insight into living with a disabling illness.

R.D.M.

PEPTIC ULCER. A. C. Ivy, M. I. Grossman, and W. H. Bachrach. 1144 pages. Price $14.00. Philadelphia and Toronto: The Blakiston Co., 1950.

Doctor Ivy and his associates have made an outstanding contribution to Medical Science in this volume. An enormous amount of material, summarizing the most significant experimental and clinical studies relating to

gastric and duodenal ulcer, has been skillfully organized and well presented.

The volume is divided into four sections: Introduction to the Problem of Peptic Ulcer; Pathogenesis; Diagnosis, and Treatment.

Each chapter in the book is concluded with a summary, and each section is concluded with a summarizing chapter. This device adds much to the clarity of the presentation and assists the reader to a better understanding of the ulcer problem as a whole.

The authors, conversant as they are with the subject, are eminently qualified to present such a critical review. The value of the book is emphasized by Dr. A. J. Carlson who has said: "This is a *must* book, not only for our colleagues in general practice but also for our colleagues in internal medicine, surgery, psychiatry and physiology."

GEORGE S. BERGH, M.D

OUT OF MY LIFE AND THOUGHT. Albert Schweitzer. New York: Henry Holt & Co., 1933 and 1949.

This autobiography of a remarkable theologian, musician and physician—all in one—first appeared in 1933 but attracted little attention. The 1949 printing of a revised volume with a postscript by Everett Skilling, close friend of Dr. Schweitzer and chairman of the Albert Schweitzer Fellowship, has had several printings.

Albert Schweitzer, an Alsatian, had already acquired distinction as a theologian, philosopher and musician when at the age of thirty he decided to study medicine after hearing of the great need for physicians in Lam-

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barane, Africa. Against the advice of friends who argued he was throwing away his great talents, he acquired a medical degree and fulfilled his ambition of establishing a hospital on the edge of an African jungle for the care of natives. The relation of the seemingly insurmountable obstacles he encountered, his method of maintaining his organ playing technique, his eventual triumph through eliciting the interest and support of citizens of many countries proves fascinating reading. That anyone could have the stamina to accomplish so much in a lifetime makes the ordinary industrious individual seem a sluggard. Truly Dr. Schweitzer's life is a demonstration of the truth that "he that loseth his life for my sake shall find it."

—C. B. D.

SURGICAL AND MAXILLOFACIAL PROSTHESIS. Oscar Edward Beder, D.D.S. 51 p. Illus. Photo offset printing. Paper bound, New York: King's Crown Press, Columbia University, 1949. Price, $3.00.

In a brief, concise manner the author, who is dental surgeon in charge of the Surgical and Maxillofacial Prosthesis Clinic at Columbia University-Presbyterian Medical Center, defines and sets forth techniques, step by step, in splints, stents, protective shields in radiation therapy, obturators, corrective appliances for missing portions of the mandible, extraoral impressions, somatoprosthesis and cranial prosthesis. It is a practical and well-organized aid-book if one already has some basic knowledge of prosthetic materials.

JEROME A. HILGER, M.D.

HARVEY CUSHING: SURGEON, AUTHOR, ARTIST. Elizabeth H. Thomson. Foreword by John F. Fulton. 347 p. Illus. New York: Henry Schuman, 1950. Price, $4.00.

Harvey Cushing's friendship with Minnesota's John Fulton, professor of physiology at Yale's Sheffield Scientific School, is elaborated upon in this biography. Fulton wrote a long, detailed life of Cushing in which his own friendship with Cushing is depreciated. Hence, this friendship is examined in this book, which is shorter to save the reader time and spare him detail.

Cushing was a man of tremendous energy and gigantic accomplishments. He was such a giant among his fellow-surgeons that his behavior in the operating room was widely imitated. Cushing was a great surgeon, great author and a splendid artist. He was a friend to all the

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great surgeons of the last half century—Kocher, Crile, the Mayo Brothers, Lord Moynihan, Fritz, Halsted, Lewis and Dean.

This book reveals Cushing as an intensely hard working, ambitious, courageous, hot-tempered surgeon who was tremendously interested in, and had tremendous identification with, his patients. He was moody, easily depressed and always overworked. His capacities were amazing. He was a bibliophile, collector of incunabula, an artist, a Pultizer Prize winner for his Sir William Osler biography; his monographs on brain tumors are the foundation stones for modern neurosurgery. He did make many trips to Europe, visiting historic medical sites, clinics and attending meetings. He rarely left the Eastern area of the United States, however, to visit the West.

COLEMAN J. CONNOLLY, M.D.

THE COMMON HEMORRHAGIC DISEASES OF CHILDHOOD

(Continued from Page 1101)

control the hemorrhage. Pseudo-hemophilia (Von Willebrand's disease) may occur in children but it is a rare clinical entity.

Summary

The hemorrhagic diseases occurring in children may be congenital or acquired. The most common congenital disease is hemophilia. The diagnosis of this entity has been facilitated by the prothrombin consumption test. The importance of local treatment in controlling hemophilic bleeding is stressed. Congenital hypoprothrombinemia simulates hemophilia. Of the acquired hemorrhagic diseases, the hypoprothrombinemia of the newborn deserves recognition since it can be prevented by giving vitamin K to the mother. Thrombocytopenic purpura is a commonly acquired hemorrhagic disease. Usually recovery is spontaneous, but a small number of cases require splenectomy.

BIRTH AND STILLBIRTH CERTIFICATES

(Continued from Page 1132)

twenty weeks of gestation has been completed. Instead of the previously required birth and death certificate only a single stillbirth form is now necessary.

The Committee of Fetus and Newborn of the American Academy of Pediatrics defines a *premature infant* as one whose weight is 5 pounds, 8 ounces, (2500 grams) or less, regardless of estimated period of gestation and other criteria. In weeks of gestation, prematurity is the period from the beginning of the twenty-eighth week to the end of the thirty-seventh week. However, the period of gestation is notoriously unreliable and hence, birth weight is the more generally accepted definition.

A study of birth certificates shows a considerable discrepancy between the birth weight and full term or prematurity. Some 300 certificates listed infants weighing less than 5½ pounds as full term, while a similar number listed infants with weights of from 6 to 9 pounds as premature infants.

During the last twenty years a great and increasing interest has been taken in the incidence of tuberculosis in nurses and the methods to be used in an endeavour to reduce this. It is now clearly recognized that nurses, even in general hospitals where tuberculosis is rigidly excluded, run a far greater risk of developing this disease than do comparable members of the general population. GEOFFREY BEWLEY, M.D. Dubl., *The Lancet*, March 25, 1950.

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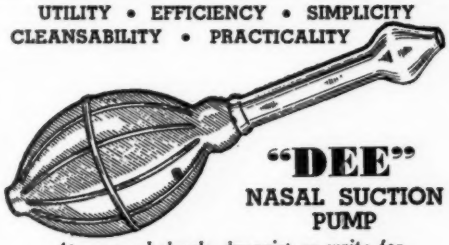

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